CIVIL AERONAUTICS MANUAL 42

U. S. Department of Commerce — Civil Aeronautics Administration

Civil Aeronautics Manuals and supplements thereto are issued by the Office of Aviation Safety, Civil Aeronautics Administration, for the guidance of the public and are published in the Federal Register and the Code of Federal Regulations.

Supplement No. 1 — **March 1, 1950**

Subject: Performance Data - Aircraft Not Certificated in the Transport Category

The purpose of this supplement is to provide holders of Civil Aeronautics Manual 42 with revised CAA rules and policies issued pursuant to Civil Air Regulation 42.16, 42.80, 42.81, 42.82, and 42.83. These revised portions of CAM 42 were published in the Federal Register on January 10, 1950.

Instructions for the insertion of revised manual pages:

REMOVE AND DESTROY THE FOLLOWING PAGES:	INSERT IN LIEU THEREOF THE FOLLOWING PAGES:
42.16-1 and on the back 42.16-1	42.16-1 and on the back 42.21
42.70 through remainder of the manual including all appendices	42.62-2 and on the back 42.70 42.77 and on the back 42.78 42.80-1 Table 3 and on the back 42.80-1 Table 3 (continued) 42.80-1 Figure 2 and on the back 42.80-1 Figure 3 42.80-2 and on the back 42.80-2 42.80-2 Figure 1 and on the back 42.80-2 Figure 2 42.80-2 Figure 3 and on the back 42.80-3 42.80-3 Figure 1 and on the back 42.80-3 Figure 2 42.80-4 and on the back 42.80-4 Figure 1 42.80-4 Figure 2 and on the back 42.80-5 42.80-5 Figure 1 and on the back 42.80-5 Figure 2 42.80-6 and on the back 42.80-6 Figure 1 42.83 and on the back 42.83 42.96-1 and on the back 42.96-1

Office of Aviation Safety — E. S. HENSLEY, Director

responsibility for maintenance, applicable time limitations, and the aircraft concerned.

"CAR § 42.12 *Fire prevention requirements.* Aircraft powered by an engine or engines rated at more than 600 h. p. each for maximum continuous operation shall, when used in passenger service, comply with the applicable fire prevention requirements of Part 4b: *Provided,* That in those instances where the Administrator, prior to the effective date of this part, has authorized an air carrier to operate aircraft without full compliance with such requirements, such aircraft may be operated in accordance with such authorization. For particular types of aircraft, where the Administrator finds that literal compliance with specific items of this requirement would not contribute materially to the objective sought, he may accept such measures of compliance as he finds will so contribute."

42.12-1 FIRE PREVENTION REQUIREMENTS. (*CAA rules which apply to section 42.12.*)

That portion of section 42.12 which requires compliance with applicable fire prevention requirements of Part 4b is interpreted as meaning those requirements contained in Part 4b *as amended September 20, 1946.*

"CAR § 42.13 *Engine rotation.* Multiengine aircraft having any engine rated at more than 480 h. p. for maximum continuous operation shall be so equipped that the crankshaft rotation of each such engine can be stopped promptly in flight."

"CAR § 42.14 *Minimum performance requirements for all aircraft.* Except as otherwise provided in this part, no air carrier shall use any aircraft unless it meets such operating limitations as the Administrator determines will provide a safe relation between the performance of the aircraft and the airports to be used and the areas to be traversed."

"CAR § 42.15 *Minimum performance requirements for large airplanes used in passenger operations.* No air carrier shall use large airplanes in passenger operations except as provided below:

"(a) Transport category airplanes shall meet the operating limitations of §§ 42.70 through 42.78.

"(b) Nontransport category airplanes shall either:

"(1) Retain their present airworthiness certificate status and shall meet the operating limitations of §§ 42.80 through 42.83, or

"(2) Qualify by showing compliance with either the performance requirements of §§ 4a.737-T through 4a.750-T, or the requirements contained in Part 4b, and when so qualified shall meet the operating limitations of §§ 42.70 through 42.78 over the area to be traversed.

"(c) Airplanes used after December 31, 1953, shall comply with all of the requirements of Part 4b, or the transport category requirements of Part 4a, and shall meet the requirements of §§ 42.70 through 42.78 over each route to be flown."

"CAR § 42.16 *Aircraft limitations for IFR and land aircraft overwater operations.* When passengers are carried, no air carrier shall use any aircraft under IFR weather conditions or any land aircraft in overwater operations except as follows:

"(a) *IFR Operations.* Aircraft shall be multiengine and shall meet the appropriate en route operating limitations of § 42.74 or § 42.82.

"(b) *Overwater operations.* Land aircraft shall be multiengine and shall meet the appropriate en route operating requirements of § 42.74 or § 42.82, unless the overwater operation consists only of take-offs and landings or the aircraft is flown at such an altitude that it can reach land in the event of power failure."

§ 42.16-1 *En route performance limitations (CAA policies which apply to § 42.16 (b)).* Performance data applicable to this section are published under §§ 42.80-1, 42.80-2, etc.

AIRCRAFT EQUIPMENT

"CAR § 42.21 *Basic required instruments and equipment for aircraft.* The following instruments and equipment acceptable to the Administrator for the type of operations specified shall be installed and in serviceable condition in all aircraft:

"(a) *VFR (day).* For day VFR flight the following is required:

"(1) Air-speed indicator,

"(2) Altimeter,

"(3) Magnetic direction indicator,

"(4) Tachometer for each engine,

"(5) Oil pressure gauge for each engine using pressure system,

"(6) Coolant temperature gauge for each liquid-cooled engine,

"(7) Oil temperature gauge for each air-cooled engine,

"(8) Manifold pressure gauge or equivalent when required for the proper operation of the engine,

"(9) Fuel gauge indicating the quantity of fuel in each tank,

"(10) Position indicator, if aircraft has retractable landing gear or flaps,

"(11) Approved seats and safety belts adequate for all persons on board the aircraft,

"(12) In passenger service, a minimum of two approved hand-type fire extinguishers, one of which is installed in the pilot compartment, the other accessible to the passengers and ground personnel, unless the aircraft is so designed that the fire extinguisher in the pilot compartment is directly available to passengers and ground personnel, in which case only one fire extinguisher is required; in cargo service, fire extinguisher or extinguishers adequate for the aircraft,

"(13) Source of electrical energy sufficient to operate all radio and electrical equipment installed,

"(14) One spare set of fuses or 3 spare fuses of each magnitude.

"(b) *VFR (night).* For night VFR flight the following is required:

"(1) Instruments and equipment specified in § 42.21 (a),

"(2) Carburetor temperature gauge,

"(3) Carburetor heating or de-icing equipment for each engine,

"(4) Set of approved forward and rear position lights,

"(5) At least one landing light,

"(6) Approved landing flares as follows, if the aircraft is operated beyond a 3-mile radius from the center of the airport of take-off:

Maximum certificated take-off weight of aircraft		*Flares*
Less than 3,500 lbs	5	class–3 or 3 class–2
3,500 lbs. to 5,000 lbs	4	class–2
More than 5,000 lbs	2	class–1 or 3 class–2 and 1 class–1

If desired, flare equipment specified for heavier aircraft may be used.

"(7) Two-way radio communications system and navigational equipment appropriate to the ground facilities to be used,

"(8) Generator of adequate capacity,

"(9) One set of instrument lights.

"(c) *IFR (day).* For day IFR flight the following is required:

"(1) Instruments and equipment specified in § 42.21 (a),

"(2) Two-way radio communications system and navigational equipment appropriate to the ground facilities to be used,

"(3) Gyroscopic rate-of-turn indicator,

"(4) Bank indicator,

"(5) Rate-of-climb indicator,

"(6) Artificial horizon indicator.

"(7) Sensitive altimeter adjustable for changes in barometric pressure, in lieu of § 42.21 (a) (2),

"(8) Clock with a sweep-second hand,

"(9) One gyro direction indicator,

"(10) Generator of adequate capacity,

"(11) One outside air temperature gauge easily readable from the pilot's position,

"(12) One carburetor temperature gauge or equivalent approved device,

air traffic control clearance shall be obtained from air traffic control.

"CAR § 42.62 *Flight manifest for large aircraft and passenger-carrying aircraft operating under IFR conditions.* For all large aircraft, or any aircraft carrying passengers under IFR conditions, a flight manifest form shall be prepared and signed for each flight by qualified personnel of the air carrier charged with the duty of supervising the loading of the aircraft and the preparation of the flight manifest form. The form and contents of this manifest shall be in accordance with the instructions contained in the air carrier's operations manual and shall include the names and addresses of the passengers carried, points of departure and destination, the weight of the cargo and passengers, and the distribution of such weight in the aircraft in accordance with the weight control system prescribed in the operations manual. The weight of the passengers may be determined in accordance with a weight control system prescribed by the Administrator. In the event passengers are picked up at points other than the principal operations base or discharged at points other than as shown on the latest manifest, the pilot shall, before starting the flight, cause a duplicate copy of the revised manifest to be mailed to such base, unless other requirements are set forth in the carrier's operations manual.[8]

"[8] See § 42.95 for record-keeping requirements for the flight manifest."

42.62-1 CONTENT OF FLIGHT MANIFEST. (*CAA policies which apply to section 42.62.*)

The flight manifest required by this section shall include at least the following information:

(a) Company or organization name.
(b) Date of flight.
(c) Flight or trip number.
(d) Point of departure.
(e) Destination (via route, etc.).
(f) Make, model, and registration number of aircraft.
(g) Names and addresses of passengers.
(h) Location and weight of crew, gasoline, oil, passengers, cargo, and ballast (if any).
(i) Empty, gross, and useful aircraft weights.
(j) Aircraft c.g. limits.
(k) C.g. of aircraft as loaded.
(l) Signature of pilot or authorized loading officer.

Extra manifest forms should be carried aboard the aircraft in order to meet the requirements in regard to discharging or picking up passengers or cargo at other than the principal operations base.

42.62-2 WEIGHT CONTROL SYSTEM. (*CAA interpretations which apply to section 42.62.*)

The weight control system as mentioned in this section includes the loading procedures as prescribed in the Operations Manual as well as the data derived from the weighing procedures or approved weight control system set forth in the Maintenance Manual.

"(c) If the airport of intended destination will not permit full compliance with paragraph (b) of this section, the aircraft may be taken off if an alternate airport is designated which permits compliance with § 42.78."

"CAR § 42.78 *Landing distance limitations; alternate airports.* No airport shall be designated as an alternate airport in a flight plan unless the aircraft at the weight at take-off can comply with the requirements of paragraphs (a) and (b) of § 42.77 at such airport: *Provided,* That the aircraft can be brought to rest within 70% of the effective length of the runway."

"CAR § 42.80 *Operating limitations for aircraft not certificated in the transport category.* In operating any passenger-carrying, large, nontransport category airplanes after January 1, 1950, the provisions of §§ 42.81 through 42.83 shall be complied with. Prior to that date, such aircraft shall be operated in accordance with such operating limitations as the Administrator determines will provide a safe relation between the performance of the aircraft and the airports to be used and the areas to be traversed. Performance data published by the Administrator for each such nontransport category type aircraft shall be used in determining compliance with these provisions."

§ 42.80–1 *Performance data on Curtiss Model C46 aircraft certificated for maximum weights of 45,000 pounds to 48,000 pounds (CAA rules which apply to § 42.80).* **The following performance limitations data, applicable to the Curtiss Model C46 aircraft shall be used in determining compliance with CAR 42.80. These data are presented in tables 1 through 3 and figures 1 through 3**

TABLE 1—TAKE-OFF LIMITATIONS

(a) "Effective length" of runway required when effective length is determined in accordance with CAR 42.1 (a) (12). (Distance to accelerate to 107 m. p. h. TIAS, and stop, with zero wind and zero gradient.)

Standard altitude in feet	Airplane weight in pounds			
	39,000	42,000	45,000	48,000 [1]
	Distance in feet			
S. L.	4,110	4,295	4,570	4,950
1,000	4,250	4,450	4,725	5,130
2,000	4,400	4,600	4,880	5,300
3,000	4,650	4,890	5,190	5,680
4,000	4,910	5,170	5,500	6,050
5,000	5,165	5,450	5,810	6,430
6,000	5,420	5,730	6,120	6,805
7,000	5,685	6,000	6,440	7,180
8,000	5,940	6,280	6,750	7,550

(b) Actual length of runway required when "effective length", considering obstacles, is not determined (Distance to accelerate to 107 m. p. h. TIAS. and stop divided by the factor 0.85.)

Standard altitude in feet	Airplane weight in pounds			
	39,000	42,000	45,000	48,000 [1]
	Distance in feet			
S. L.	4,835	5,050	5,375	5,825
1,000	5,000	5,235	5,555	6,035
2,000	5,175	5,410	5,740	6,235
3,000	5,470	5,750	6,105	6,680
4,000	5,775	6,080	6,470	7,120
5,000	6,075	6,410	6,830	7,565
6,000	6,375	6,740	7,200	8,005
7,000	6,690	7,060	7,575	8,445
8,000	6,990	7,390	7,940	8,880

[1] For use with Curtiss Model C46 airplanes when approved for this weight.

TABLE 2—EN ROUTE LIMITATIONS

(a) Curtiss Model C-46 certificated for maximum weight of 45,000 pounds (based on a climb speed of 130 m. p. h. (TIAS)).

Weight (pounds)	Terrain clearance [1] (feet)	Blower setting
45,000	6,450	Low.
44,000	7,000	Low.
43,000	7,550	Low.
42,200	8,000	High.
41,000	9,600	High
40,000	11,000	High.
39,000	12,300	High

(b) Curtiss Model C-46 certificated for maximum weight of 48,000 pounds or with engine installation approved for 2,550 r. p. m. (1,700 B. hp.). Maximum continuous power in low blower [2] (based on a climb speed of 130 m. p. h (TIAS))

Weight (pounds)	Terrain clearance [1] (feet)	Blower setting
48,000	5,850	Low.
47,000	6,300	Low
46,000	6,700	Low
45,000	7,200	Low
44,500	7,450	Low.
44,250	8,000	High.
44,000	8,550	High.
43,000	10,800	High.
42,000	12,500	High
41,000	13,000	High.

[1] Highest altitude of terrain over which airplane may be operated in compliance with CAR 42.82.

[2] Engine installations having P&W R-2800-27, -43, -51, -71, -75, -79 engines can be approved for 1,700 B. hp. in low blower. See engine specification chapter 19, page 30.02 revised Oct. 10. 1949.

Airplane Flight Manual must be revised accordingly.

TABLE 3—LANDING LIMITATIONS

(a) "Effective length" of runway required when effective length is determined in accordance with CAR 42.1 (a) (12) with zero wind and zero gradient. (1) Curtiss Model C-46 certificated for maximum weight of 45,000 pounds.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h.							
	40,000	V_{50}	42,000	V_{50}	44,000	V_{50}	45,000	V_{50}
	Distance in feet							
S. L.	3,700	99.0	3,855	101.5	4,030	104.0	4,110	105.0
1,000	3,800	99.0	3,960	101.5	4,140	104.0	4,220	105.0
2,000	3,900	99.0	4,070	101.5	4,250	104.0	4,335	105.0
3,000	4,050	99.0	4,180	101.5	4,360	104.0	4,450	105.0
4,000	4,110	99.0	4,290	101.5	4,475	104.0	4,565	105.0
5,000	4,215	99.0	4,400	101.5	4,595	104.0	4,680	105.0
6,000	4,330	99.0	4,515	101.5	4,710	104.0	4,800	105.0
7,000	4,430	99.0	4,635	101.5	4,845	104.0	4,930	105.0
8,000	4,550	99.0	4,755	101.5	4,970	104.0	5,060	105.0

(2) Curtiss Model C-46 certificated for maximum weight of 48,000 pounds.[2]

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h.							
	42,000	V_{50}	44,000	V_{50}	46,000	V_{50}	48,000	V_{50}
	Distance in feet							
S. L.	2,890	92.5	3,000	94.5	3,110	97.5	3,215	99.0
1,000	2,960	92.5	3,070	94.5	3,180	97.5	3,285	99.0
2,000	3,035	92.5	3,145	94.5	3,250	97.5	3,360	99.0
3,000	3,110	92.5	3,215	94.5	3,330	97.5	3,430	99.0
4,000	3,185	92.5	3,300	94.5	3,410	97.5	3,520	99.0
5,000	3,260	92.5	3,370	94.5	3,495	97.5	3,615	99.0
6,000	3,330	92.5	3,460	94.5	3,580	97.5	3,700	99.0
7,000	3,415	92.5	3,545	94.5	3,670	97.5	3,800	99.0
8,000	3,500	92.5	3,635	94.5	3,765	97.5	3,900	99.0

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with CAR 42.1 (a) (12).

(1) Curtiss Model C-46 certificated for maximum weight of 45,000 pounds.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h.							
	40,000	V_{50}	42,000	V_{50}	44,000	V_{50}	45,000	V_{50}
	Distance in feet							
S. L.	4,710	99.0	4,910	101.5	5,130	104.0	5,230	105.0
1,000	4,835	99.0	5,040	101.5	5,270	104.0	5,370	105.0
2,000	4,965	99.0	5,180	101.5	5,410	104.0	5,520	105.0
3,000	5,155	99.0	5,320	101.5	5,550	104.0	5,665	105.0
4,000	5,230	99.0	5,460	101.5	5,695	104.0	5,810	105.0
5,000	5,365	99.0	5,600	101.5	5,850	104.0	5,955	105.0
6,000	5,510	99.0	5,745	101.5	5,995	104.0	6,110	105.0
7,000	5,640	99.0	5,900	101.5	6,165	104.0	6,275	105.0
8,000	5,790	99.0	6,050	101.5	6,325	104.0	6,440	105.0

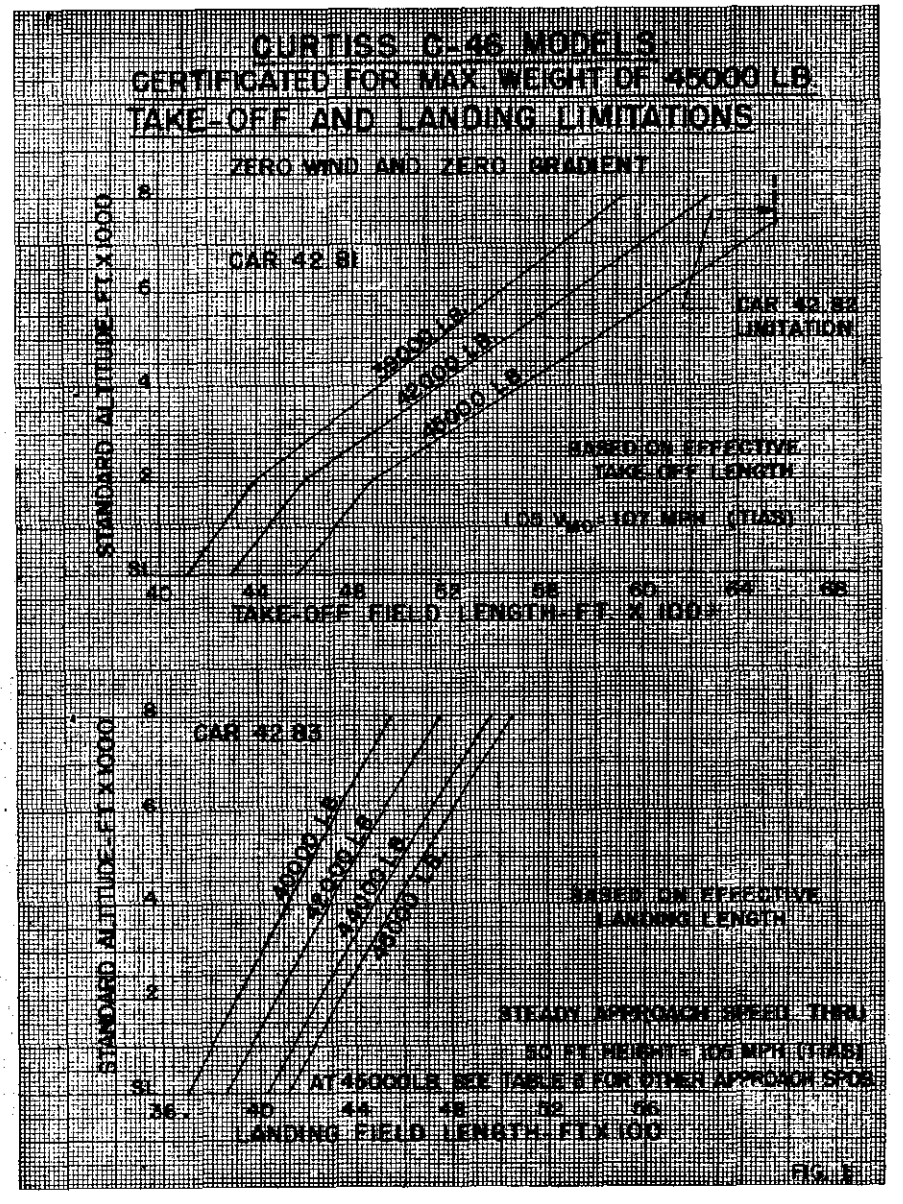
[1] Steady approach speed through 50 foot-height-m. p. h. TIAS denoted by symbol V_{50}.
[2] For use with Curtiss Model C-46 aircraft when approved for this weight.

TABLE 3—LANDING LIMITATIONS—(Continued)

(2) Curtiss C-46 certificated for maximum weight of 48,000 pounds.[2]

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h.							
	42,000	V_{50}	44,000	V_{50}	46,000	V_{50}	48,000	V_{50}
	Distance in feet							
S. L.	3,680	92.5	3,820	94.5	3,960	97.5	4,090	99.0
1,000	3,765	92.5	3,905	94.5	4,045	97.5	4,180	99.0
2,000	3,860	92.5	4,000	94.5	4,135	97.5	4,275	99.0
3,000	3,960	92.5	4,090	94.5	4,240	97.5	4,365	99.0
4,000	4,055	92.5	4,200	94.5	4,340	97.5	4,480	99.0
5,000	4,150	92.5	4,290	94.5	4,450	97.5	4,600	99.0
6,000	4,240	92.5	4,405	94.5	4,555	97.5	4,710	99.0
7,000	4,345	92.5	4,510	94.5	4,670	97.5	4,835	99.0
8,000	4,455	92.5	4,625	94.5	4,790	97.5	4,965	99.0

[1] Steady approach speed through 50 foot-height-m. p. h. TIAS denoted by symbol V_{50}.
[2] For use with Curtiss Model C-46 aircraft when approved for this weight.



either side of the intended track. Transport category airplanes certificated under Part 4a are not required to comply with this section. For the purpose of this section it shall be assumed that the weight of the airplane as it proceeds along its intended track is progressively reduced by the anticipated consumption of fuel and oil."

"CAR § 42.74 *En route limitations; one engine inoperative.* No airplane of a maximum certificated weight of less than 40,000 lbs. shall be taken off at a weight in excess of that which would permit a rate of climb (expressed in feet per minute), with one engine inoperative, of at least 0.02 $V_{s_0}^2$ (when V_{s_0} is expressed in miles per hour) at an altitude of at least 1,000 feet above the elevation of the highest ground or obstruction within 10 miles either side of the intended track; for airplanes of a maximum certificated weight of 40,000 to 60,000 lbs., inclusive, the rate of climb shall increase linearly in relation to weight to 0.04 $V_{s_0}^2$; for airplanes of a maximum certificated weight of over 60,000 lbs. the rate of climb shall be 0.04 $V_{s_0}^2$; for transport category airplanes certificated under Part 4a the rate of climb shall be 0.02 $V_{s_0}^2$ for all maximum certificated weights. For the purpose of this section it shall be assumed that the weight of the airplane as it proceeds along its intended track is progressively reduced by the anticipated consumption of fuel and oil."

"CAR § 42.75 *En route limitations; two engines inoperative.* No airplane having four or more engines shall be flown along an intended track except under the following conditions: *Provided,* That this section shall not apply to transport category airplanes certificated under Part 4a:

"(a) No place along the intended track shall be more than 90 minutes away from an available landing area at which a landing may be made in accordance with the requirements of § 42.78, assuming all engines are operating at cruising speed; or

"(b) The take-off weight is such that the airplane with two engines inoperative shall have a rate of climb (expressed in feet per minute) of at least 0.01 $V_{s_0}^2$ (when V_{s_0} is expressed in miles per hour) either at an altitude of 1,000 feet above the elevation of the highest ground or obstruction within 10 miles on either side of the intended track or at an altitude of 5,000 feet, whichever is higher.

"(1) The rate of climb referred to in this paragraph shall be determined by assuming the airplane's weight to be either that attained at the moment of failure of the second engine, assuming that failure to occur 90 minutes after departure, or that which may be attained by dropping fuel at the moment of failure of the second engine, assuming that sufficient fuel is retained to arrive at an altitude of at least 1,000 feet directly over the landing area."

"CAR § 42.76 *En route limitations; where special air navigational facilities exist.* The 10-mile lateral distance specified in §§ 42.73 through 42.76 may, for a distance of no more than 20 miles, be reduced to 5 miles: *Provided,* That special air navigational facilities provide a reliable and accurate identification of any high ground or obstruction located outside of such 5-mile lateral distance but within the 10-mile distance."

"CAR § 42.77 *Landing distance limitations; airport of destination.* No airplane shall be taken off at a weight in excess of that which, under the conditions stated hereinafter in paragraphs (a) and (b) of this section, would permit the airplane to be brought to rest at the field of intended destination within 60% of the effective length of the runway from a point 50 feet directly above the intersection of the obstruction clearance line and the runway. For the purpose of this section it shall be assumed that the take-off weight of the airplane is reduced by the weight of the fuel and oil expected to be consumed in flight to the field of intended destination.

"(a) It shall be assumed that the aircraft is landed on the most favorable runway and direction without regard to wind.

"(b) It shall be assumed, considering every probable wind velocity and direction, that the aircraft is landed on the most suitable runway, taking due account of the ground handling characteristics of the airplane and allowing for the effect on the landing path and roll of not more than 50% of the favorable wind component.

"(c) If the airport of intended destination will not permit full compliance with paragraph (b) of this section, the aircraft may be taken off if an alternate airport is designated which permits compliance with § 42.78."

"CAR § 42.78 *Landing distance limitations; alternate airports.* No airport shall be designated as an alternate airport in a flight plan unless the aircraft at the weight at take-off can comply with the requirements of paragraphs (a) and (b) of § 42.77 at such airport: *Provided,* That the aircraft can be brought to rest within 70% of the effective length of the runway."

"CAR § 42.80 *Operating limitations for aircraft not certificated in the transport category.* In operating any passenger-carrying, large, nontransport category airplanes after January 1, 1950, the provisions of §§ 42.81 through 42.83 shall be complied with. Prior to that date, such aircraft shall be operated in accordance with such operating limitations as the Administrator determines will provide a safe relation between the performance of the aircraft and the airports to be used and the areas to be traversed. Performance data published by the Administrator for each such nontransport category type aircraft shall be used in determining compliance with these provisions."

§ 42.80–1 *Performance data on Curtiss Model C46 aircraft certificated for maximum weights of 45,000 pounds to 48,000 pounds (CAA rules which apply to § 42.80).* The following performance limitations data, applicable to the Curtiss Model C46 aircraft shall be used in determining compliance with CAR 42.80. These data are presented in tables 1 through 3 and figures 1 through 3

TABLE 1—TAKE-OFF LIMITATIONS

(a) "Effective length" of runway required when effective length is determined in accordance with CAR 42.1 (a) (12). (Distance to accelerate to 107 m. p. h. TIAS, and stop, with zero wind and zero gradient.)

Standard altitude in feet	Airplane weight in pounds			
	39,000	42,000	45,000	48,000 [1]
	Distance in feet			
S. L.	4,110	4,295	4,570	4,950
1,000	4,250	4,450	4,725	5,130
2,000	4,400	4,600	4,880	5,300
3,000	4,650	4,890	5,190	5,680
4,000	4,910	5,170	5,500	6,050
5,000	5,165	5,450	5,810	6,430
6,000	5,420	5,730	6,120	6,805
7,000	5,685	6,000	6,440	7,180
8,000	5,940	6,280	6,750	7,550

(b) Actual length of runway required when "effective length", considering obstacles, is not determined (Distance to accelerate to 107 m. p. h. TIAS. and stop divided by the factor 0.85.)

Standard altitude in feet	Airplane weight in pounds			
	39,000	42,000	45,000	48,000 [1]
	Distance in feet			
S. L.	4,835	5,050	5,375	5,825
1,000	5,000	5,235	5,555	6,035
2,000	5,175	5,410	5,740	6,235
3,000	5,470	5,750	6,105	6,680
4,000	5,775	6,080	6,470	7,120
5,000	6,075	6,410	6,830	7,565
6,000	6,375	6,740	7,200	8,005
7,000	6,690	7,060	7,575	8,445
8,000	6,990	7,390	7,940	8,880

[1] For use with Curtiss Model C46 airplanes when approved for this weight.

TABLE 2—EN ROUTE LIMITATIONS

(a) Curtiss Model C-46 certificated for maximum weight of 45,000 pounds (based on a climb speed of 130 m. p. h. (TIAS)).

Weight (pounds)	Terrain clearance [1] (feet)	Blower setting
45,000	6,450	Low.
44,000	7,000	Low.
43,000	7,550	Low.
42,200	8,000	High.
41,000	9,600	High
40,000	11,000	High.
39,000	12,300	High.

(b) Curtiss Model C-46 certificated for maximum weight of 48,000 pounds or with engine installation approved for 2,550 r. p. m. (1,700 B. hp.). Maximum continuous power in low blower [2] (based on a climb speed of 130 m. p. h (TIAS))

Weight (pounds)	Terrain clearance [1] (feet)	Blower setting
48,000	5,850	Low.
47,000	6,300	Low
46,000	6,700	Low
45,000	7,200	Low
44,500	7,450	Low.
44,250	8,000	High.
44,000	8,550	High.
43,000	10,800	High.
42,000	12,500	High
41,000	13,000	High.

[1] Highest altitude of terrain over which airplane may be operated in compliance with CAR 42.82.

[2] Engine installations having P&W R-2800-27, -43, -51, -71, -75, -79 engines can be approved for 1,700 B. hp. in low blower. See engine specification chapter 19. page 30.02 revised Oct. 10. 1949.

Airplane Flight Manual must be revised accordingly.

air traffic control clearance shall be obtained from air traffic control.

"CAR § 42.62 *Flight manifest for large aircraft and passenger-carrying aircraft operating under IFR conditions.* For all large aircraft, or any aircraft carrying passengers under IFR conditions, a flight manifest form shall be prepared and signed for each flight by qualified personnel of the air carrier charged with the duty of supervising the loading of the aircraft and the preparation of the flight manifest form. The form and contents of this manifest shall be in accordance with the instructions contained in the air carrier's operations manual and shall include the names and addresses of the passengers carried, points of departure and destination, the weight of the cargo and passengers, and the distribution of such weight in the aircraft in accordance with the weight control system prescribed in the operations manual. The weight of the passengers may be determined in accordance with a weight control system prescribed by the Administrator. In the event passengers are picked up at points other than the principal operations base or discharged at points other than as shown on the latest manifest, the pilot shall, before starting the flight, cause a duplicate copy of the revised manifest to be mailed to such base, unless other requirements are set forth in the carrier's operations manual.[3]

"[3] See § 42.95 for record-keeping requirements for the flight manifest."

42.62-1 CONTENT OF FLIGHT MANIFEST. (*CAA policies which apply to section 42.62.*)

The flight manifest required by this section shall include at least the following information:

(a) Company or organization name.
(b) Date of flight.
(c) Flight or trip number.
(d) Point of departure.
(e) Destination (via route, etc.).
(f) Make, model, and registration number of aircraft.
(g) Names and addresses of passengers.
(h) Location and weight of crew, gasoline, oil, passengers, cargo, and ballast (if any).
(i) Empty, gross, and useful aircraft weights.
(j) Aircraft c.g. limits.
(k) C.g. of aircraft as loaded.
(l) Signature of pilot or authorized loading officer.

Extra manifest forms should be carried aboard the aircraft in order to meet the requirements in regard to discharging or picking up passengers or cargo at other than the principal operations base.

42.62-2 WEIGHT CONTROL SYSTEM. (*CAA interpretations which apply to section 42.62.*)

The weight control system as mentioned in this section includes the loading procedures as prescribed in the Operations Manual as well as the data derived from the weighing procedures or approved weight control system set forth in the Maintenance Manual.

OPERATING LIMITATIONS FOR LARGE PASSENGER-CARRYING AIRPLANES

"CAR § 42.70 *Operating limitations for transport category airplanes.* (a) In operating any passenger-carrying transport category airplane the provisions of §§ 42.71 through 42.78 shall be complied with unless deviations therefrom are specifically authorized by the Administrator on the ground that the special circumstances of a particular case make a literal observance of the requirements unnecessary for safety.

"(b) For transport category aircraft the data contained in the Airplane Flight Manual shall be applied in determining compliance with these provisions. Where conditions differ from those for which specific tests were made, compliance shall be determined by interpolation or by computation of the effects of changes in the specific variables where such interpolations or computations will give results substantially equalling in accuracy the results of a direct test.

"(c) No airplane shall be taken off at a weight which exceeds the allowable weight for the runway being used as determined in accordance with the take-off runway limitations of the transport category operating rules, after taking into account the temperature operating correction factors required by §§ 4a.749a–T or 4b.98, and set forth in the Airplane Flight Manual for the airplane."

"CAR § 42.71 *Weight limitations.* (a) No airplane shall be taken off from any airport located at an elevation outside of the altitude range for which maximum take-off weights have been determined, and no airplane shall depart for an airport of intended destination, or have any airport specified as an alternate, which is located at an elevation outside of the altitude range for which maximum landing weights have been determined.

"(b) The weight of the airplane at take-off shall not exceed the authorized maximum take-off weight for the elevation of the airport from which the take-off is to be made.

"(c) The weight at take-off shall be such that, allowing for normal consumption of fuel and oil in flight to the airport of intended destination, the weight on arrival will not exceed the authorized maximum landing weight for the elevation of such airport."

"CAR § 42.72 *Take-off limitations to provide for engine failure.* No take-off shall be made except under conditions which will permit compliance with the following requirements.

"(a) It shall be possible, from any point on the take-off up to the time of attaining the critical-engine-failure speed, to bring the airplane to a safe stop on the runway, as shown by the accelerate-stop distance data.

"(b) It shall be possible, if the critical engine should fail at any instant after the airplane attains the critical-engine-failure speed, to proceed with the take-off and attain a height of 50 feet, as indicated by the take-off path data, before passing over the end of the take-off area. Thereafter, it shall be possible to clear all obstacles, either by at least 50 feet vertically, as shown by the take-off path data, or by at least 200 feet horizontally within the airport boundaries and by at least 300 feet horizontally after passing beyond such boundaries.

"(1) In determining the allowable deviation of the flight path in order to avoid obstacles by at least the distances above set forth, it shall be assumed that the airplane is not banked before reaching a height of 50 feet, as shown by the take-off path data, and that a maximum bank thereafter does not exceed 15°.

"(c) In applying conditions in paragraphs (a) and (b) of this section, correction shall be made for any gradient of the take-off surface. Take-off data based on still air may be corrected to allow for the effect of a favorable wind according to reported wind conditions: *Provided,* That not more than 50% of the wind component along the direction of take-off may be used.[9]

"[9] It will be noted that Special Civil Air Regulations Serial Number 397 requires the pilot to take account of temperature variations as well as his wind component in take-off."

"CAR § 42.73 *En route limitations; all engines operating.* No airplane shall be taken off at a weight in excess of that which would permit a rate of climb (expressed in feet per minute), with all engines operating, of at least 6 V_{s_0} (when V_{s_0} is expressed in miles per hour) at an altitude of at least 1,000 feet above the elevation of the highest ground or obstruction within 10 miles of

TABLE 3—LANDING LIMITATIONS

(a) "Effective length" of runway required when effective length is determined in accordance with CAR 42.1 (a) (12) with zero wind and zero gradient. (1) Curtiss Model C–46 certificated for maximum weight of 45,000 pounds.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h.							
	40,000	V_{50}	42,000	V_{50}	44,000	V_{50}	45,000	V_{50}
	Distance in feet							
S. L.	3,700	99.0	3,855	101.5	4,030	104.0	4,110	105.0
1,000	3,800	99.0	3,960	101.5	4,140	104.0	4,220	105.0
2,000	3,900	99.0	4,070	101.5	4,250	104.0	4,335	105.0
3,000	4,050	99.0	4,180	101.5	4,360	104.0	4,450	105.0
4,000	4,110	99.0	4,290	101.5	4,475	104.0	4,565	105.0
5,000	4,215	99.0	4,400	101.5	4,595	104.0	4,680	105.0
6,000	4,330	99.0	4,515	101.5	4,710	104.0	4,800	105.0
7,000	4,430	99.0	4,635	101.5	4,845	104.0	4,930	105.0
8,000	4,550	99.0	4,755	101.5	4,970	104.0	5,060	105.0

(2) Curtiss Model C–46 certificated for maximum weight of 48,000 pounds.[2]

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h.							
	42,000	V_{50}	44,000	V_{50}	46,000	V_{50}	48,000	V_{50}
	Distance in feet							
S. L.	2,890	92.5	3,000	94.5	3,110	97.5	3,215	99.0
1,000	2,960	92.5	3,070	94.5	3,180	97.5	3,285	99.0
2,000	3,035	92.5	3,145	94.5	3,250	97.5	3,360	99.0
3,000	3,110	92.5	3,215	94.5	3,330	97.5	3,430	99.0
4,000	3,185	92.5	3,300	94.5	3,410	97.5	3,520	99.0
5,000	3,260	92.5	3,370	94.5	3,495	97.5	3,615	99.0
6,000	3,330	92.5	3,460	94.5	3,580	97.5	3,700	99.0
7,000	3,415	92.5	3,545	94.5	3,670	97.5	3,800	99.0
8,000	3,500	92.5	3,635	94.5	3,765	97.5	3,900	99.0

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with CAR 42.1 (a) (12).

(1) Curtiss Model C–46 certificated for maximum weight of 45,000 pounds.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h.							
	40,000	V_{50}	42,000	V_{50}	44,000	V_{50}	45,000	V_{50}
	Distance in feet							
S. L.	4,710	99.0	4,910	101.5	5,130	104.0	5,230	105.0
1,000	4,835	99.0	5,040	101.5	5,270	104.0	5,370	105.0
2,000	4,965	99.0	5,180	101.5	5,410	104.0	5,520	105.0
3,000	5,155	99.0	5,320	101.5	5,550	104.0	5,665	105.0
4,000	5,230	99.0	5,460	101.5	5,695	104.0	5,810	105.0
5,000	5,365	99.0	5,600	101.5	5,850	104.0	5,955	105.0
6,000	5,510	99.0	5,745	101.5	5,995	104.0	6,110	105.0
7,000	5,640	99.0	5,900	101.5	6,165	104.0	6,275	105.0
8,000	5,790	99.0	6,050	101.5	6,325	104.0	6,440	105.0

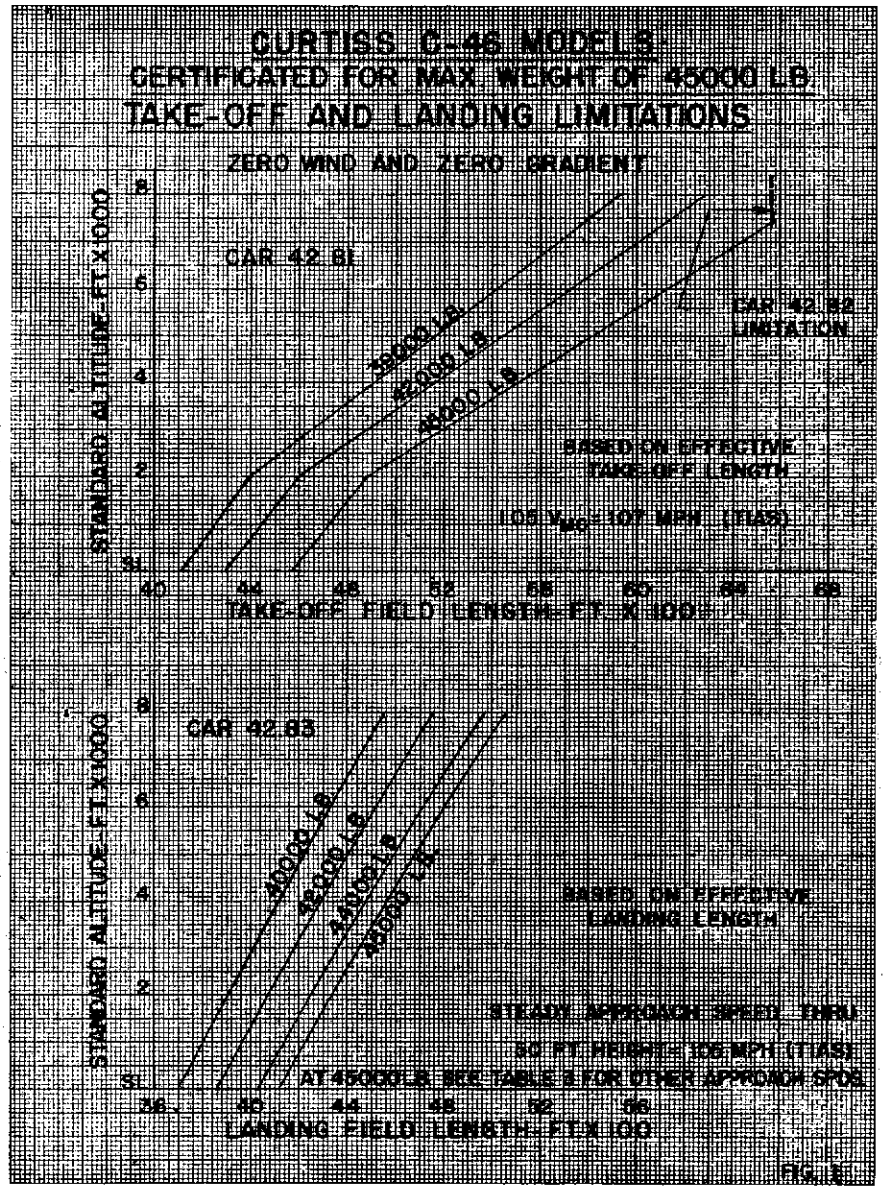
[1] Steady approach speed through 50 foot-height-m. p. h. TIAS denoted by symbol V_{50}.
[2] For use with Curtiss Model C–46 aircraft when approved for this weight.

TABLE 3—LANDING LIMITATIONS—(Continued)

(2) Curtiss C-46 certificated for maximum weight of 48,000 pounds.[2]

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h.							
	42,000	V_{50}	44,000	V_{50}	46,000	V_{50}	48,000	V_{50}
	Distance in feet							
S. L.	3,680	92.5	3,820	94.5	3,960	97.5	4,090	99.0
1,000	3,765	92.5	3,905	94.5	4,045	97.5	4,180	99.0
2,000	3,860	92.5	4,000	94.5	4,135	97.5	4,275	99.0
3,000	3,960	92.5	4,090	94.5	4,240	97.5	4,365	99.0
4,000	4,055	92.5	4,200	94.5	4,340	97.5	4,480	99.0
5,000	4,150	92.5	4,290	94.5	4,450	97.5	4,600	99.0
6,000	4,240	92.5	4,405	94.5	4,555	97.5	4,710	99.0
7,000	4,345	92.5	4,510	94.5	4,670	97.5	4,835	99.0
8,000	4,455	92.5	4,625	94.5	4,790	97.5	4,965	99.0

[1] Steady approach speed through 50 foot-height-m. p. h. TIAS denoted by symbol V_{50}.
[2] For use with Curtiss Model C-46 aircraft when approved for this weight.



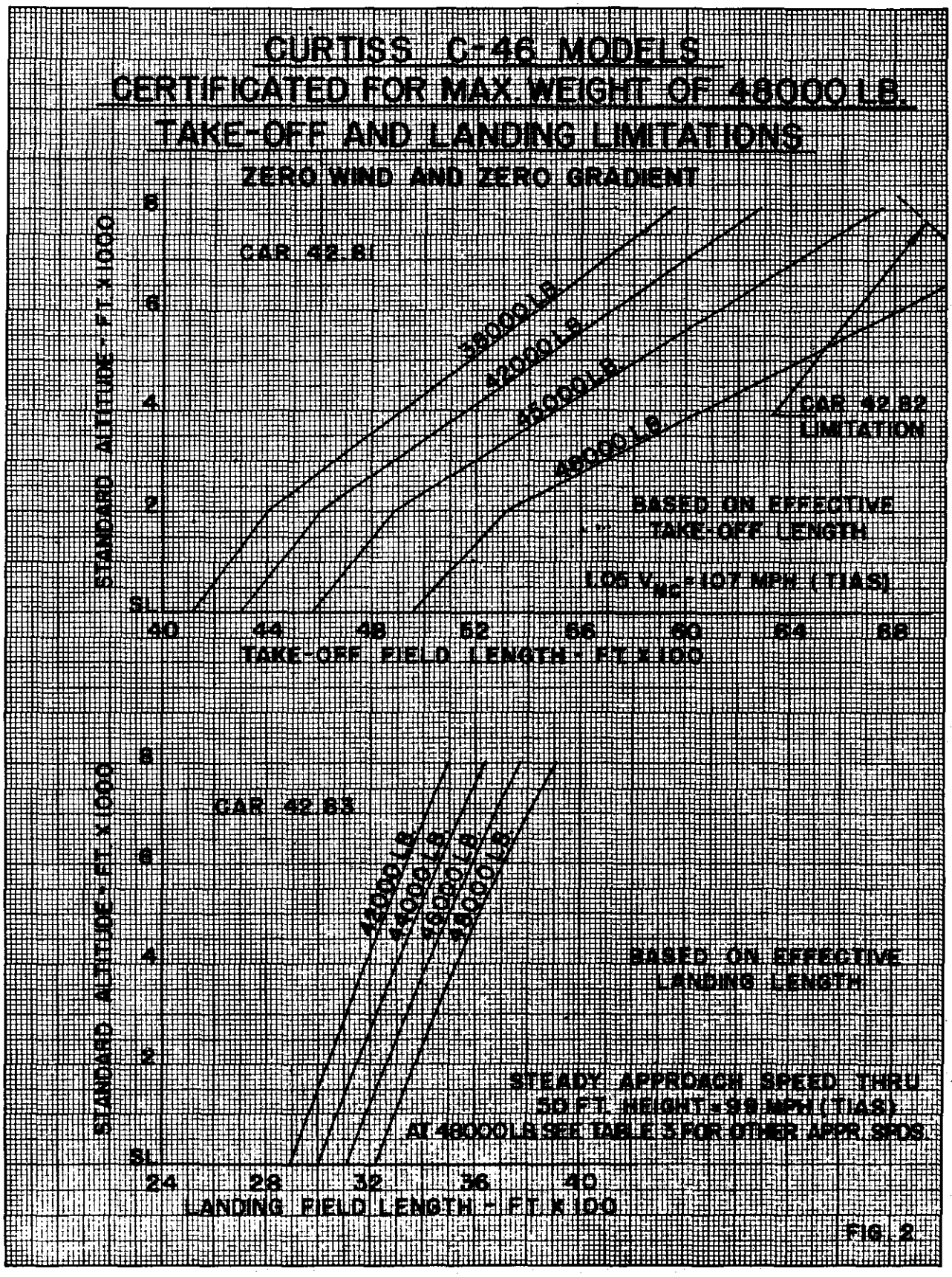

CURTISS C-46 MODELS
CERTIFICATED FOR MAX. WEIGHT OF 48000 LB.
TAKE-OFF AND LANDING LIMITATIONS
ZERO WIND AND ZERO GRADIENT
CAR 42.81
STANDARD ALTITUDE - FT. X 1000
SL
2
4
6
8
40
44
48
52
56
60
64
68
TAKE-OFF FIELD LENGTH - FT. X 100
48000 LB
44000 LB
40000 LB
CAR 42.82 LIMITATION
BASED ON EFFECTIVE TAKE-OFF LENGTH
1.05 V_{MC} = 107 MPH (TIAS)
CAR 42.83
BASED ON EFFECTIVE LANDING LENGTH
STEADY APPROACH SPEED THRU 50 FT. HEIGHT = 99 MPH (TIAS) AT 48000 LBS SEE TABLE 3 FOR OTHER APPR. SPDS.
24
28
32
36
40
LANDING FIELD LENGTH - FT. X 100

FIG. 2

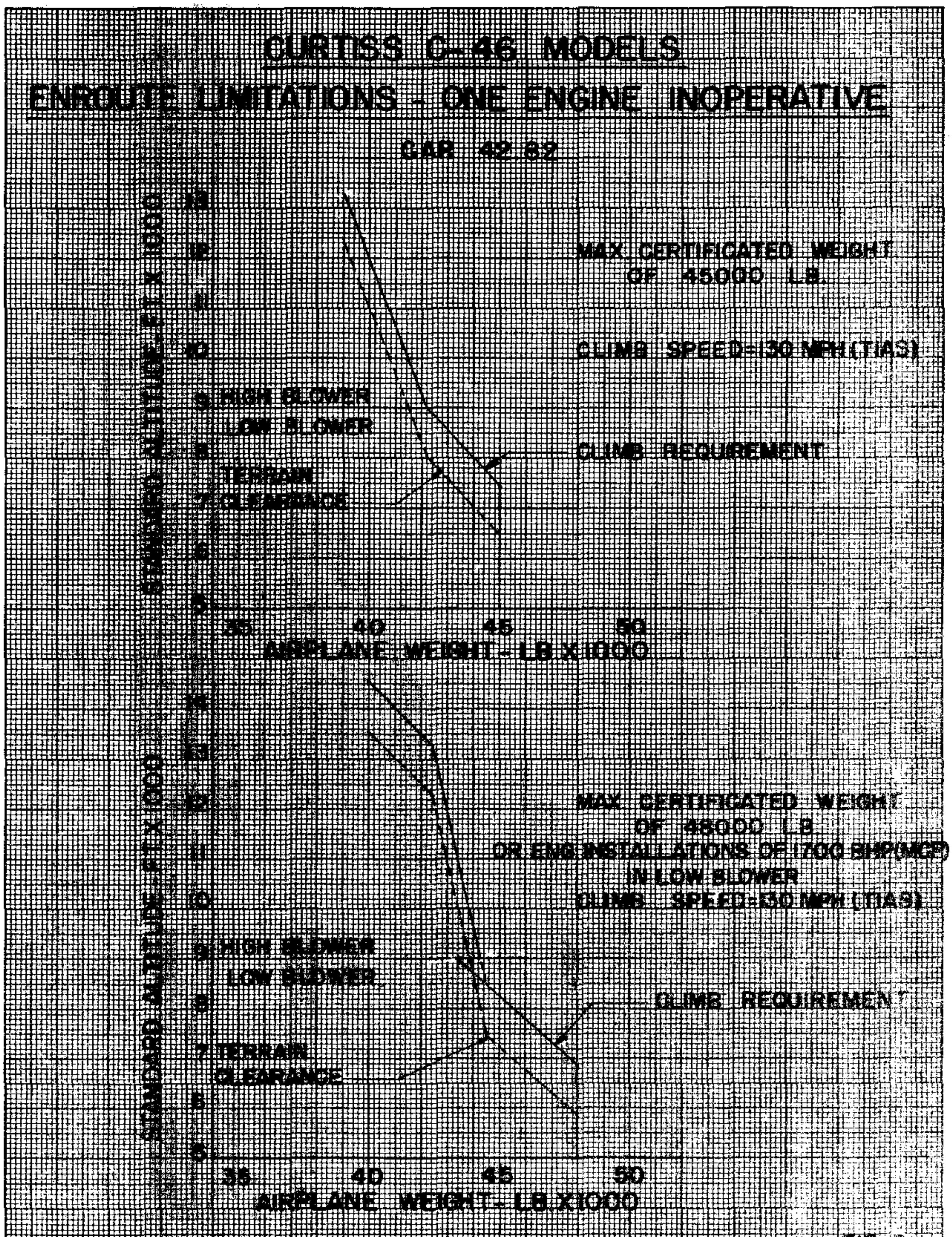

CURTISS C-46 MODELS
ENROUTE LIMITATIONS - ONE ENGINE INOPERATIVE
CAR 42.82
STANDARD ALTITUDE - FT X 1000
MAX. CERTIFICATED WEIGHT OF 45000 LB.
CLIMB SPEED=130 MPH (TIAS)
HIGH BLOWER
LOW BLOWER
CLIMB REQUIREMENT
TERRAIN CLEARANCE
35 40 45 50
AIRPLANE WEIGHT - LB X 1000
STANDARD ALTITUDE - FT X 1000
MAX. CERTIFICATED WEIGHT OF 48000 LB.
OR ENG. INSTALLATIONS OF 1700 BHP(MCP) IN LOW BLOWER
CLIMB SPEED=130 MPH (TIAS)
HIGH BLOWER
LOW BLOWER
CLIMB REQUIREMENT
TERRAIN CLEARANCE
35 40 45 50
AIRPLANE WEIGHT - LB X 1000

FIG. 3

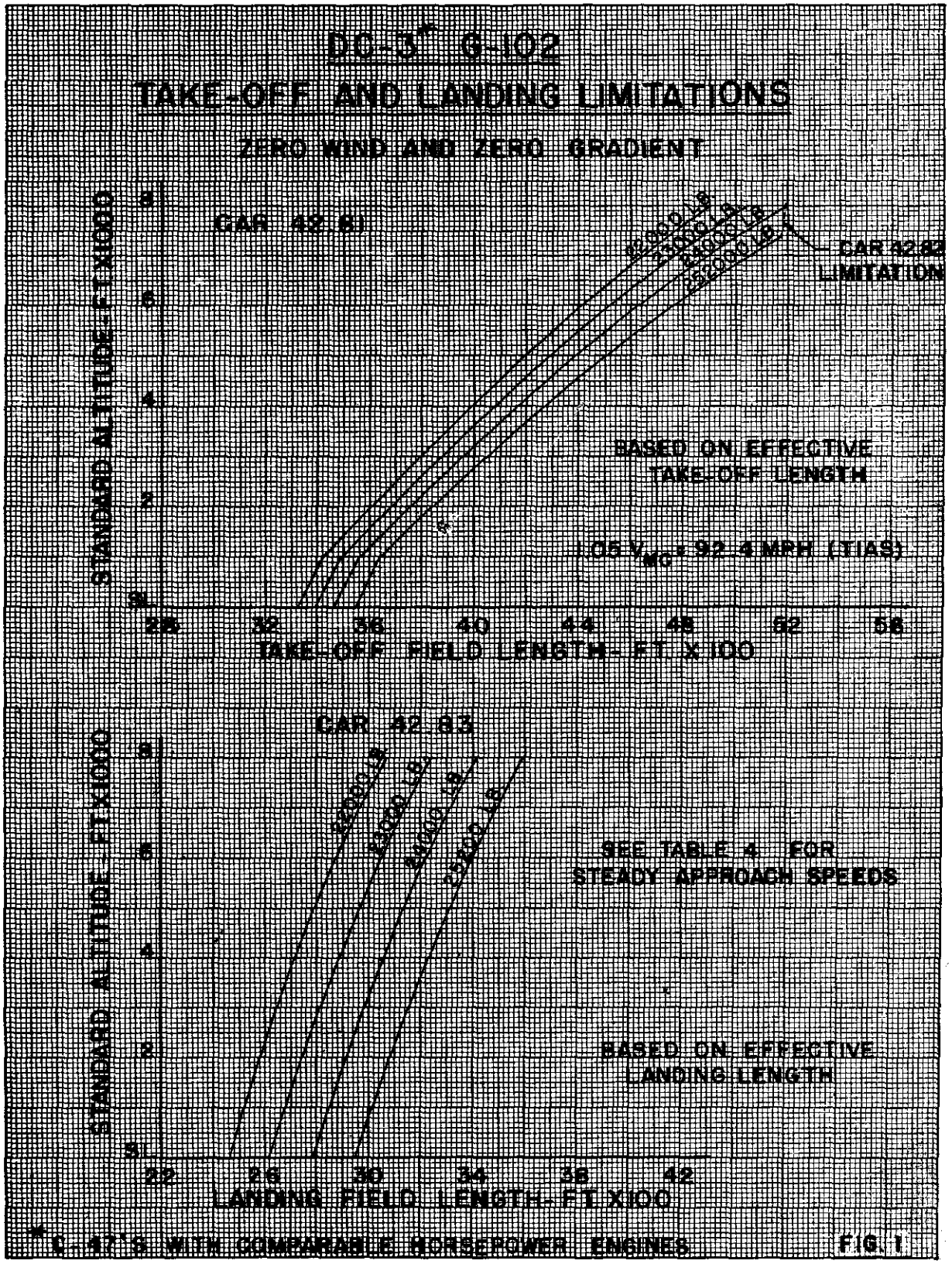

DC-3* G-102
TAKE-OFF AND LANDING LIMITATIONS
ZERO WIND AND ZERO GRADIENT
STANDARD ATMOSPHERE PRESSURE ALTITUDE X 1000
CAR 42.81
CAR 42.82 LIMITATION
BASED ON EFFECTIVE TAKE-OFF LENGTH
1.05 V_{MC} = 92.4 MPH (TIAS)
TAKE-OFF FIELD LENGTH - FT. X 100
CAR 42.83
SEE TABLE 4 FOR STEADY APPROACH SPEEDS
BASED ON EFFECTIVE LANDING LENGTH
LANDING FIELD LENGTH - FT. X100
*C-47'S WITH COMPARABLE HORSEPOWER ENGINES

FIG. 1

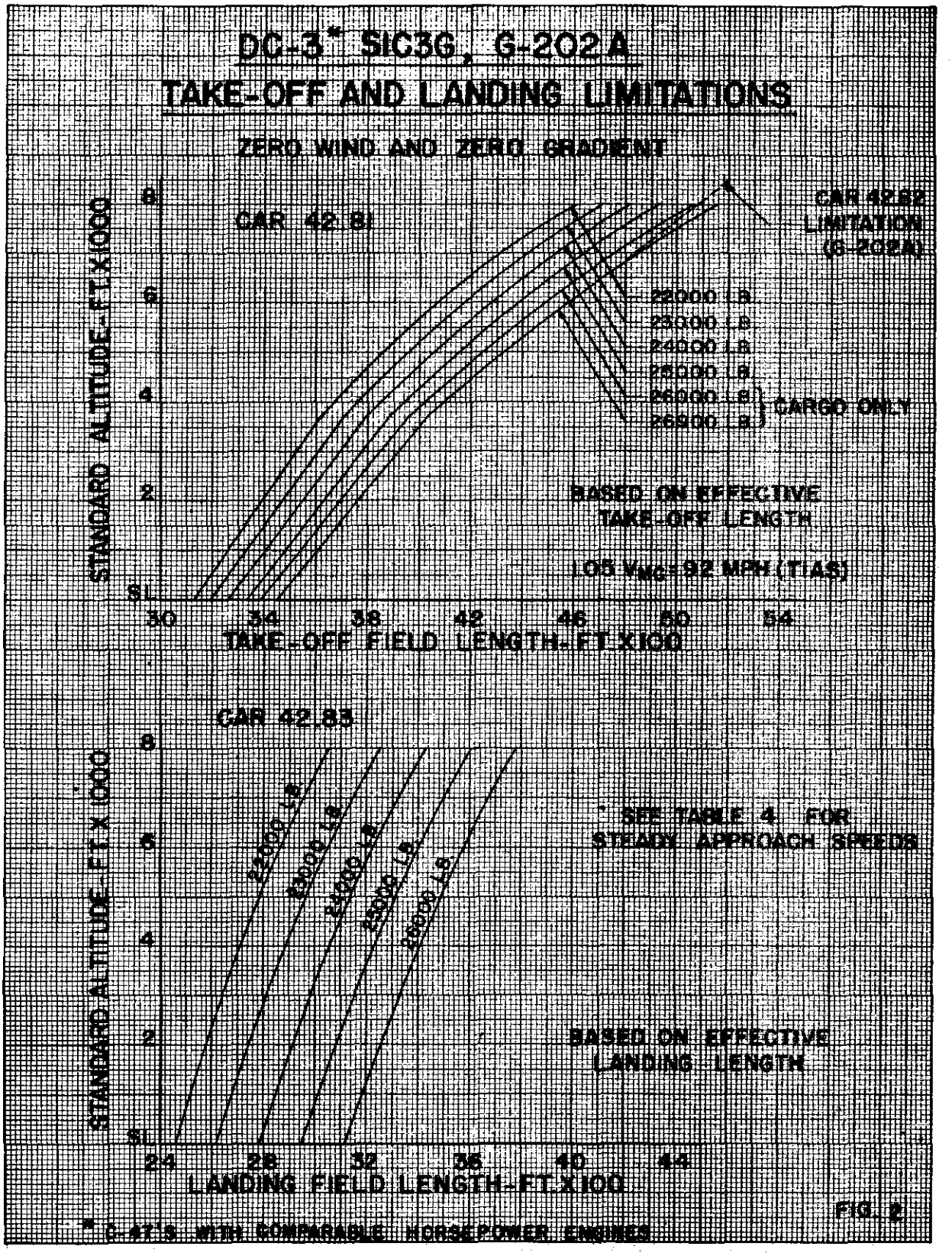

DC-3* SIC3G, G-202A
TAKE-OFF AND LANDING LIMITATIONS
ZERO WIND AND ZERO GRADIENT
CAR 42.81
CAR 42.82 LIMITATION (G-202A)
22000 LB.
23000 LB.
24000 LB.
25000 LB.
26000 LB.
26900 LB.
CARGO ONLY
BASED ON EFFECTIVE TAKE-OFF LENGTH
1.05 VMC = 92 MPH (TIAS)
STANDARD ALTITUDE-FT.X1000
SL
2
4
6
8
30
34
38
42
46
50
54
TAKE-OFF FIELD LENGTH-FT.X100
CAR 42.83
SEE TABLE 4 FOR STEADY APPROACH SPEEDS
BASED ON EFFECTIVE LANDING LENGTH
24
28
32
36
40
44
LANDING FIELD LENGTH-FT.X100
* G-47'S WITH COMPARABLE HORSEPOWER ENGINES

FIG. 2

§ 42.80–2 *Performance data on Douglas DC–3 aircraft (CAA rules which apply to § 42.80).* The following performance limitations data, applicable to all Douglas DC–3 aircraft with various engine models, shall be used in determining compliance with CAR 42.80. These data are presented in tables 1 through 4 and figures 1 through 3.

DOUGLAS DC–3 G102, AND C–47's, R4D's WITH COMPARABLE HORSEPOWER ENGINES

TABLE 1—TAKE-OFF LIMITATIONS

(a) "Effective length" of runway required when effective length is determined in accordance with CAR 42.1 (a) (12). (Distance to accelerate to 92.0 m. p. h., TIAS, and stop with zero wind and zero gradient.)

Standard altitude in feet	Airplane weight in pounds			
	22,000	23,000	24,000	25,200
	Distance in feet			
S. L.	3,325	3,395	3,460	3,545
1,000	3,425	3,495	3,560	3,645
2,000	3,610	3,685	3,760	3,840
3,000	3,800	3,880	3,960	4,050
4,000	3,990	4,080	4,170	4,270
5,000	4,200	4,290	4,390	4,500
6,000	4,415	4,520	4,630	4,760
7,000	4,650	4,770	4,895	5,050
8,000	4,900	5,040	5,190	(1)

(b) Actual length of runway required when "effective length", considering obstacles, is not determined. (Distance to accelerate to 92.0 m. p. h. TIAS, and stop, divided by factor 0.85.)

Standard altitude in feet	Airplane weight in pounds			
	22,000	23,000	24,000	25,200
	Distance in feet			
S. L.	3,910	3,990	4,070	4,170
1,000	4,030	4,110	4,185	4,285
2,000	4,245	4,335	4,420	4,515
3,000	4,470	4,565	4,655	4,765
4,000	4,690	4,800	4,905	5,020
5,000	4,940	5,045	5,160	5,290
6,000	5,190	5,315	5,445	5,600
7,000	5,470	5,610	5,755	5,940
8,000	5,760	5,925	6,105	(1)

[1] Limited by CAR 42.82.

DOUGLAS DC–3 G202A, S1C3G AND C47's, R4D's WITH COMPARABLE HORSEPOWER ENGINES

TABLE 2—TAKE-OFF LIMITATIONS

(a) "Effective length" of runway required where effective length is determined in accordance with CAR 42.1 (a) (12). (Distance to accelerate to 92.0 m. p. h. TIAS, and stop, with zero wind and zero gradient.)

Standard altitude in feet	Airplane weight in pounds					
	22,000	23,000	24,000	25,000	26,000 [1]	26,900 [1]
	Distance in feet					
S. L.	3,125	3,195	3,260	3,330	3,385	3,450
1,000	3,255	3,320	3,395	3,470	3,525	3,595
2,000	3,390	3,460	3,540	3,610	3,685	3,750
3,000	3,525	3,610	3,690	3,775	3,850	3,920
4,000	3,680	3,775	3,860	3,950	4,035	4,110
5,000	3,855	3,960	4,060	4,150	4,255	4,315
6,000	4,060	4,170	4,280	4,385	4,490	4,575
7,000	4,300	4,415	4,530	4,640	4,750	4,845
8,000	4,600	4,700	4,810	4,925	5,055	5,150

(b) Actual length of runway required where "effective length," considering obstacles, is not determined. (Distance to accelerate to 92.0 m. p. h., TIAS, and stop, divided by factor 0.85.)

Standard altitude in feet	Airplane weight in pounds					
	22,000	23,000	24,000	25,000	26,000 [1]	26,900 [1]
	Distance in feet					
S. L.	3,675	3,755	3,835	3,915	3,980	4,055
1,000	3,830	3,905	3,990	4,080	4,145	4,230
2,000	3,985	4,070	4,165	4,245	4,335	4,410
3,000	4,145	4,245	4,340	4,440	4,530	4,610
4,000	4,330	4,440	4,540	4,645	4,745	4,835
5,000	4,535	4,655	4,775	4,880	5,005	5,075
6,000	4,775	4,905	5,035	5,155	5,280	5,380
7,000	5,055	5,190	5,325	5,455	5,585	5,700
8,000	5,410	5,525	5,655	5,790	5,945	6,055

[1] Cargo operation only but not required under CAR 42.80.

DOUGLAS DC–3, G102, G202A, S1C3G, C–47's, R4D's WITH COMPARABLE HORSEPOWER ENGINES

TABLE 3—EN ROUTE LIMITATIONS

Weight in pounds	Terrain clearance [1] in feet and climb speed in m. p. h. TIAS					
	G102	V_c	G202A	V_c	S1C3G	V_c
25,200	6,400	110.0	7,500	109.5	10,600	106.5
24,000	7,550	108.0	8,700	108.0	12,100	104.0
23,000	8,500	106.0	9,750	105.0	13,450	101.5
22,000	9,500	104.5	10,750	103.0	14,750	99.5
21,000	10,500	102.5	11,750	101.0	16,100	98.5

[1] Highest altitude of terrain over which airplane may be operated in compliance with CAR 42.82.

DOUGLAS DC-3 G102, G202A S1C3G, AND C47's, R4D's WITH COMPARABLE HORSEPOWER ENGINES

TABLE 4—LANDING LIMITATIONS

(a) "Effective length" of runway required when effective length is determined in accordance with CAR 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in fee	Airplane weight in pounds and approach speeds [1] in m. p. h.							
	22,000	V_{50}	23,000	V_{50}	24,000	V_{50}	25,200	V_{50}
	Distance in feet							
S. L.	2,460	86	2,620	88	2,790	90	2,950	92
1,000	2,520	86	2,680	88	2,850	90	3,015	92
2,000	2,580	86	2,745	88	2,915	90	3,080	92
3,000	2,645	86	2,815	88	2,980	90	3,155	92
4,000	2,710	86	2,885	88	3,060	90	3,230	92
5,000	2,790	86	2,965	88	3,135	90	3,310	92
6,000	2,870	86	3,050	88	3,220	90	3,400	92
7,000	2,965	86	3,140	88	3,315	90	3,490	92
8,000	3,045	86	3,240	88	3,420	90	3,595	92

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with CAR 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h.							
	22,000	V_{50}	23,000	V_{50}	24,000	V_{50}	25,000	V_{50}
	Distance in feet							
S. L.	3,125	86	3,325	88	3,545	90	3,745	92
1,000	3,200	86	3,390	88	3,620	90	3,830	92
2,000	3,275	86	3,485	88	3,700	90	3,910	92
3,000	3,360	86	3,575	88	3,785	90	4,005	92
4,000	3,440	86	3,665	88	3,885	90	4,100	92
5,000	3,545	86	3,765	88	3,980	90	4,205	92
6,000	3,645	86	3,875	88	4,090	90	4,320	92
7,000	3,765	86	3,990	88	4,210	90	4,430	92
8,000	3,865	86	4,115	88	4,345	90	4,565	92

[1] Steady approach speed through 50 feet height-m. p. h. TIAS denoted by symbol V_{50}.

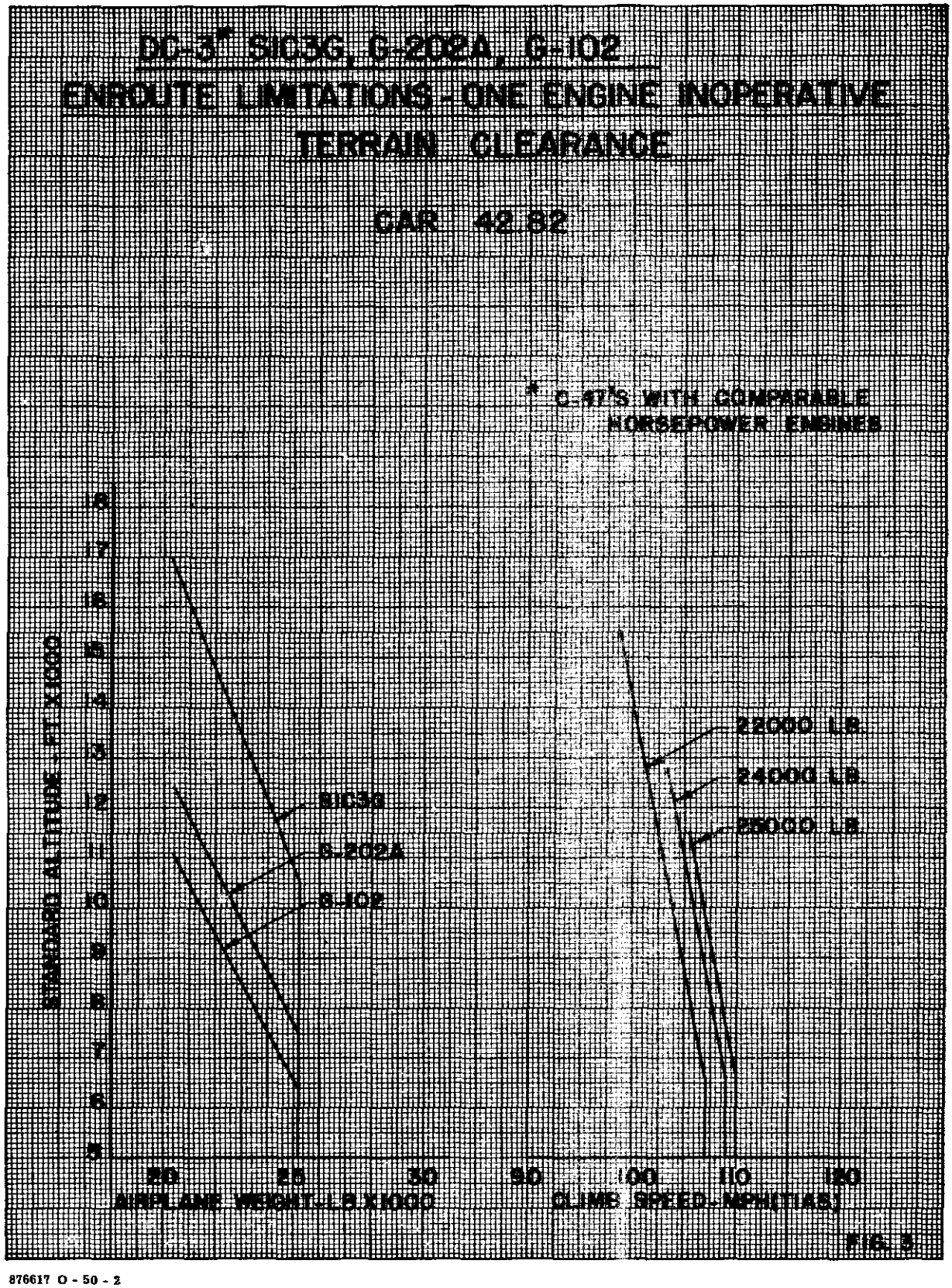

DC-3* SIC3G, G-202A, G-102
ENROUTE LIMITATIONS - ONE ENGINE INOPERATIVE
TERRAIN CLEARANCE
CAR 42.82
* C-47'S WITH COMPARABLE HORSEPOWER ENGINES
STANDARD ALTITUDE - 1000 FT.
18
17
16
15
14
13
12
11
10
9
8
7
6
5
SIC3G
G-202A
G-102
22000 LB.
24000 LB.
25000 LB.
20
25
30
90
100
110
120
AIRPLANE WEIGHT-LBS X1000
CLIMB SPEED-MPH(TIAS)

FIG. 3

§ 42.80–3 *Performance data on Lockheed 18 G202A aircraft (CAA rules which apply to § 42.80).* **The following performance limitations data, applicable to Lockheed 18 G202A aircraft shall be used in determining compliance with CAR 42.80. These data are presented in tables 1 through 3 and figures 1 and 2.**

TABLE 1—TAKE-OFF LIMITATIONS

(a) "Effective length" of runway required when effective length is determined in accordance with CAR 42.1 (a) (12). (Distance to accelerate to 114.5 m. p. h., TIAS, and stop, with zero wind and zero gradient.)

Standard altitude in feet	Airplane weight in pounds		
	17,500	18,000	18,500
	Distance in feet		
S. L.	5,470	5,670	5,830
1,000	5,725	5,925	6,100
2,000	5,980	6,185	6,380
3,000	6,250	6,460	6,670
4,000	6,520	6,740	6,950
5,000	6,800	7,030	7,250
6,000	7,100	7,330	7,570
7,000	7,405	7,650	7,890
8,000	7,750	8,000	8,240

(b) Actual length of runway required when "effective length," considering obstacles, is not determined. (Distance to accelerate to 107 m. p. h. TIAS, and stop, divided by the factor 0.85.)

Standard altitude in feet	Airplane weight in pounds		
	17,500	18,000	18,500
	Distance in feet		
S. L.	6,430	6,665	6,855
1,000	6,730	6,965	7,175
2,000	7,030	7,275	7,500
3,000	7,350	7,595	7,845
4,000	7,665	7,925	8,175
5,000	7,995	8,265	8,525
6,000	8,350	8,620	8,900
7,000	8,760	8,995	9,280
8,000	9,115	9,410	9,690

TABLE 2—EN ROUTE LIMITATIONS

Weight in pounds	Terrain clearance [1] in feet and climb speed in m. p. h. TIAS	
	Feet	Miles per hour
18,500	9,800	120.5
18,000	10,600	119.0
17,500	11,350	117.5
17,000	12,150	116.5
16,500	12,900	115.0
16,000	13,700	114.0

[1] Highest altitude of terrain over which airplane may be operated in compliance with CAR 42.82.

TABLE 3—LANDING LIMITATIONS

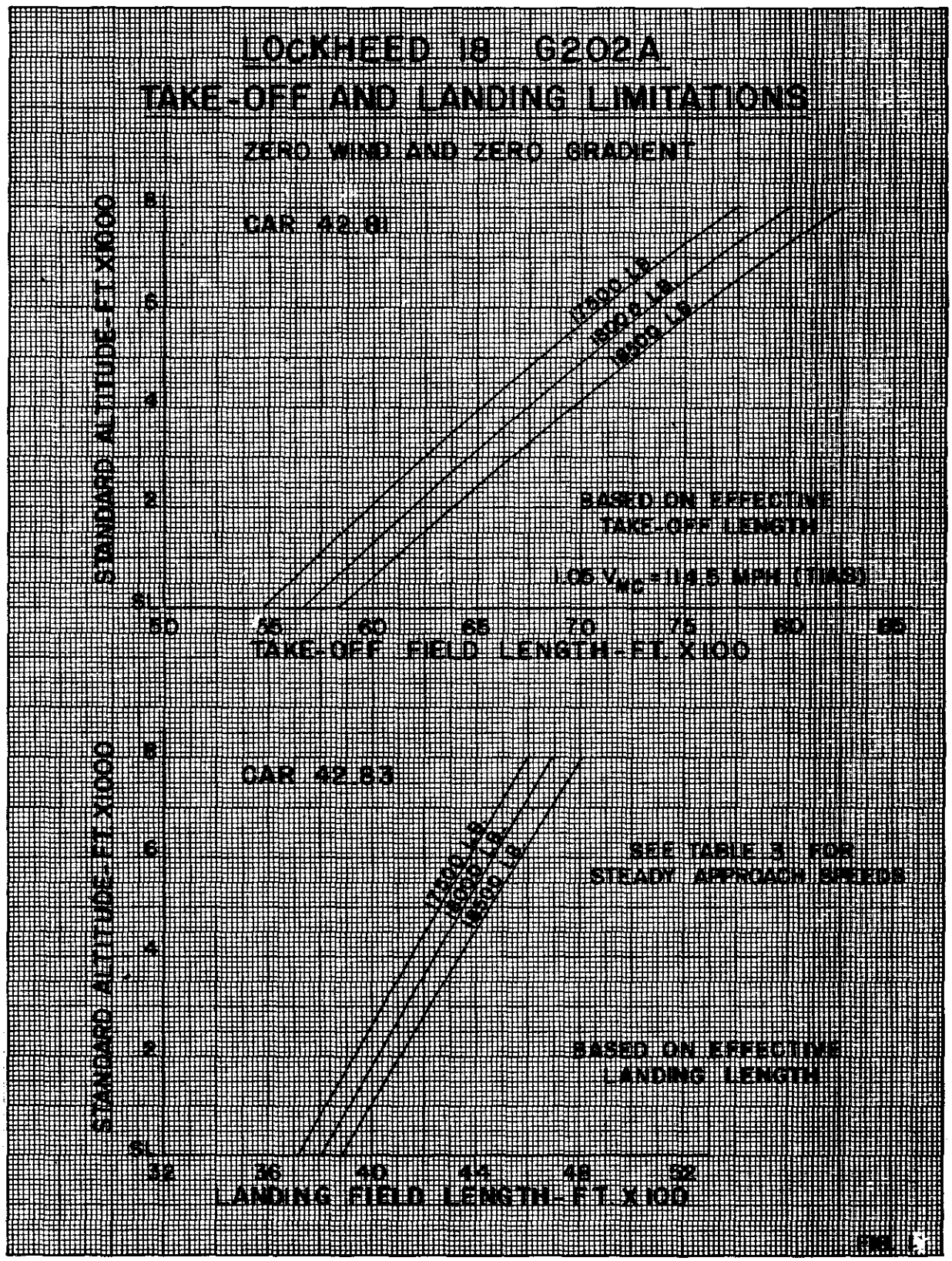
(a) "Effective length" of runway required when effective length is determined in accordance with CAR 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h.					
	17,500	V_{50}	18,000	V_{50}	18,500	V_{50}
	Distance in feet					
S. L.	3,715	96	3,810	97	3,885	99
1,000	3,825	96	3,910	97	3,995	99
2,000	3,930	96	4,020	97	4,105	99
3,000	4,040	96	4,130	97	4,220	99
4,000	4,150	96	4,240	97	4,335	99
5,000	4,240	96	4,350	97	4,450	99
6,000	4,370	96	4,460	97	4,570	99
7,000	4,480	96	4,575	97	4,690	99
8,000	4,595	96	4,690	97	4,810	99

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with CAR 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h.					
	17,500	V_{50}	18,000	V_{50}	18,500	V_{50}
	Distance in feet					
S. L.	4,720	96	4,840	97	4,935	99
1,000	4,860	96	4,965	97	5,075	99
2,000	4,990	96	5,105	97	5,215	99
3,000	5,130	96	5,245	97	5,360	99
4,000	5,270	96	5,385	97	5,505	99
5,000	5,385	96	5,525	97	5,650	99
6,000	5,550	96	5,665	97	5,805	99
7,000	5,690	96	5,810	97	5,955	99
8,000	5,835	96	5,955	97	6,110	99

[1] Steady approach speed through 50-foot height m. p. h. TIAS denoted by symbol V_{50}.


LOCKHEED 18 G2O2A
TAKE-OFF AND LANDING LIMITATIONS
ZERO WIND AND ZERO GRADIENT
CAR 42.91
STANDARD ALTITUDE-FT X1000
8
6
4
2
SL
50
55
60
65
70
75
80
85
TAKE-OFF FIELD LENGTH-FT X100
BASED ON EFFECTIVE TAKE-OFF LENGTH
1.05 V_{MC} = 114.5 MPH (TIAS)
CAR 42.93
SEE TABLE 3 FOR STEADY APPROACH SPEEDS
BASED ON EFFECTIVE LANDING LENGTH
32
36
40
44
48
52
LANDING FIELD LENGTH-FT X100
FIG. 1

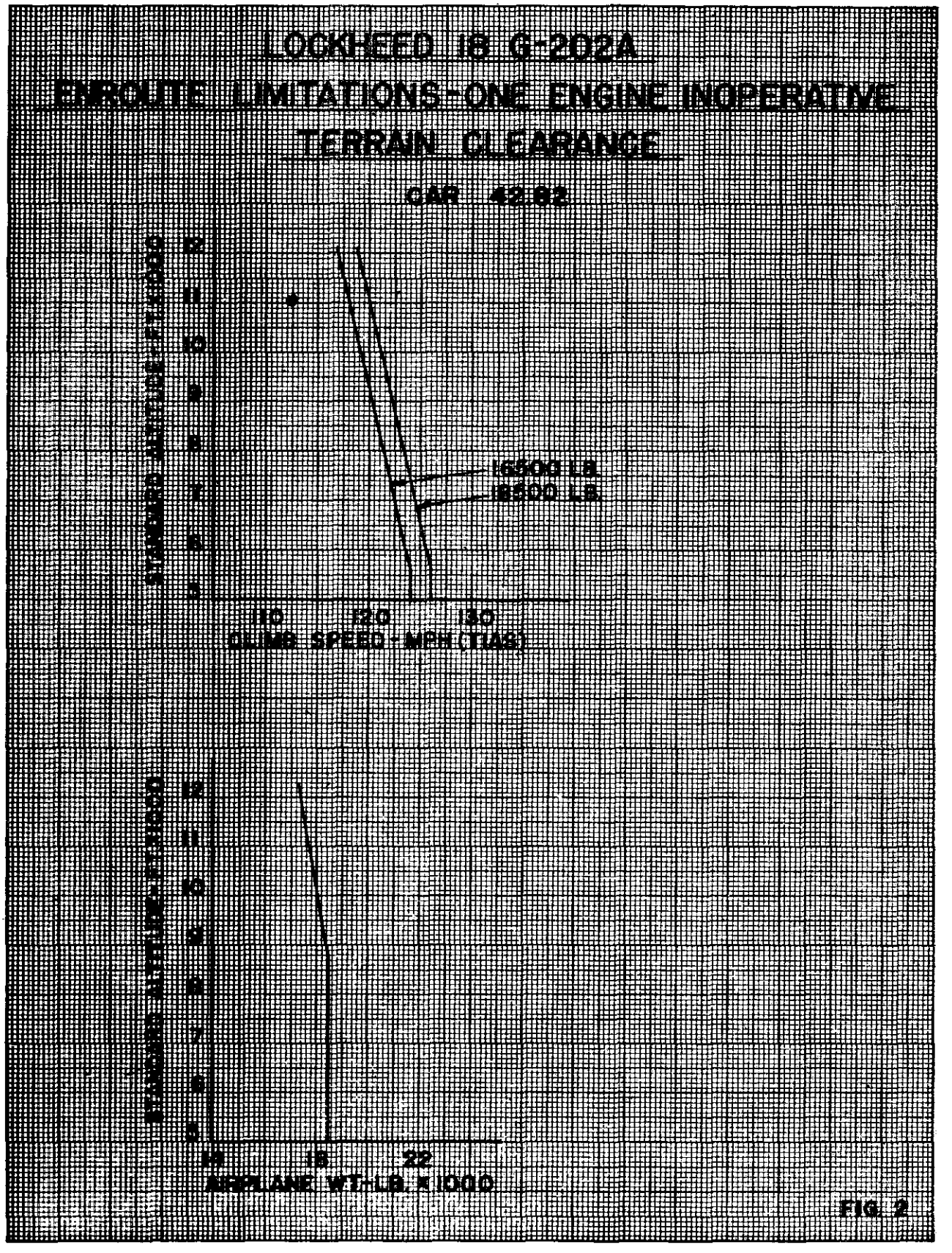

LOCKHEED 18 G-202A
ENROUTE LIMITATIONS-ONE ENGINE INOPERATIVE
TERRAIN CLEARANCE
CAR 42.82
STANDARD ATMOSPHERE-THOUSANDS OF FEET
12
11
10
9
8
7
6
5
16500 LB.
18500 LB.
110
120
130
CLIMB SPEED - MPH (TIAS)
STANDARD ATMOSPHERE-THOUSANDS OF FEET
12
11
10
9
8
7
6
5
18
22
AIRPLANE WT-LB. X 1000

FIG. 2

§ 42.80-4 *Convair Model 28-5ACF and PBY-5A landplane aircraft (CAA rules which apply to § 42.80).* **The following performance limitations data, applicable to Convair Model 28-5ACF and PBY-5A landplane aircraft shall be used in determining compliance with CAR 42.80. These data are presented in tables 1 through 4 and figures 1 and 2.**

TABLE 1—TAKE-OFF LIMITATIONS

(a) "Effective length" of runway required when effective length is determined in accordance with 42.1 (a) (12). (Distance to accelerate to 91 m. p. h, TIAS (28-5ACF), 95 m. p. h, TIAS (PBY-5A), and stop, with zero wind and zero gradient.)

Standard altitude in feet	Airplane weight in pounds					
	23,000	24,000	25,000	26,000	27,000 [1]	28,000 [2]
	Distance in feet					
S. L.	3,240	3,400	3,565	3,725	3,880	4,050
1,000	3,370	3,540	3,720	3,885	4,055	4,225
2,000	3,500	3,680	3,875	4,045	4,230	4,400
3,000	3,635	3,830	4,025	4,200	4,400	4,580
4,000	3,860	4,070	4,280	4,485	4,700	4,900
5,000	4,095	4,315	4,540	4,770	5,000	5,215
6,000	4,330	4,565	4,810	5,060	5,305	5,545
7,000	4,580	4,830	5,090	5,360	5,610	5,880
8,000	4,830	5,095	5,380	5,660	5,940	6,240

(b) Actual length of runway required when "effective length", considering obstacles, is not determined. (Distance to accelerate to 91 mph, TIAS (28-5ACF), 95 mph, TIAS (PBY-5A), and stop, divided by the factor 0.85.)

Standard altitude in feet	Airplane weight in pounds					
	23,000	24,000	25,000	26,000	27,000 [1]	28,000 [2]
	Distance in feet					
S. L.	3,810	4,000	4,190	4,380	4,560	4,760
1,000	3,965	4,165	4,375	4,570	4,770	4,970
2,000	4,115	4,330	4,557	4,755	4,975	5,175
3,000	4,275	4,505	4,735	4,940	5,175	5,385
4,000	4,540	4,785	5,035	5,275	5,525	5,760
5,000	4,815	5,075	5,340	5,610	5,880	6,130
6,000	5,090	5,370	5,655	5,950	6,240	6,520
7,000	5,385	5,680	5,985	6,305	6,600	6,915
8,000	5,680	5,990	6,325	6,655	6,985	7,340

[1] Maximum weight for PBY-5A landplane.
[2] Maximum weight for 28-5ACF.

TABLE 2—EN ROUTE LIMITATIONS

Weight in pounds	Terrain clearance [1] in feet and climb speed in m. p. h. TIAS			
	Model PBY-5A		Model 28-5ACF	
	Feet	Miles per hour	Feet	Miles per hour
28,000			7,500	104.0
27,500			8,000	103.0
27,000	7,200	93.5	8,500	102.0
26,500	7,700	92.5	9,050	101.0
26,000	8,200	91.5	9,600	100.0
25,500	8,700	90.5	10,100	99.0
25,000	9,200	89.0	10,650	97.5
24,500	9,700	88.0	11,150	96.5
24,000	10,200	87.0	11,700	95.0

[1] Highest altitude of terrain over which airplane may be operated in compliance with CAR 42.82

TABLE 3—LANDING LIMITATIONS

(a) "Effective length" of runway required when effective length is determined in accordance with CAR 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h. TIAS					
	23,000	V_{50}	24,000	V_{50}	25,000	V_{50}
	Distance in feet					
S. L.	3,420	86	3,570	88	3,690	90
1,000	3,515	86	3,665	88	3,800	90
2,000	3,605	86	3,765	88	3,900	90
3,000	3,700	86	3,860	88	4,010	90
4,000	3,790	86	3,955	88	4,110	90
5,000	3,885	86	4,055	88	4,215	90
6,000	3,975	86	4,150	88	4,320	90
7,000	4,070	86	4,245	88	4,425	90
8,000	4,160	86	4,340	88	4,525	90

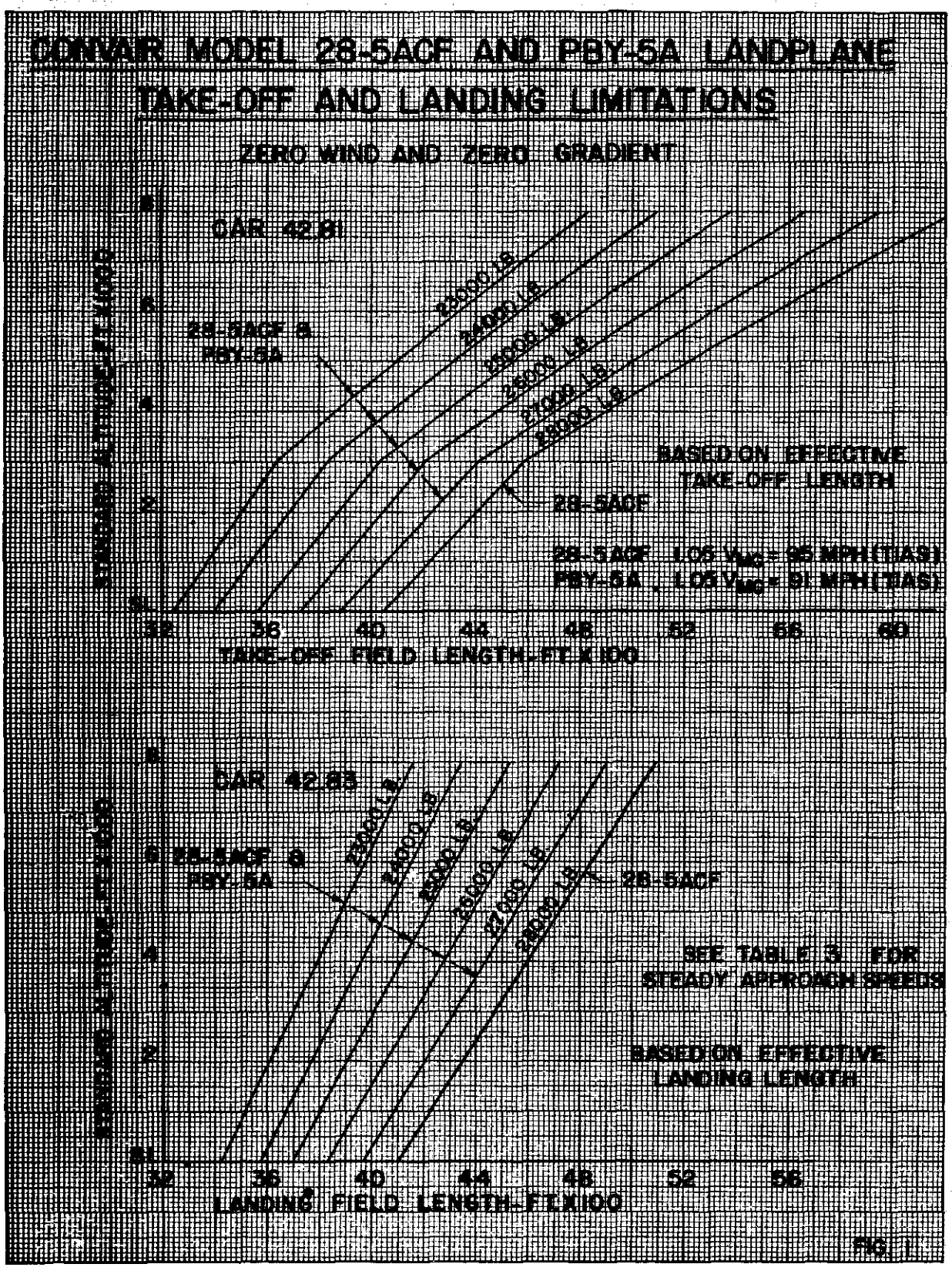
[1] Steady approach speed through 50 feet height in m. p. h. TIAS denoted by symbol V_{50}.

TABLE 3—LANDING LIMITATIONS—Continued

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with CAR 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h. TIAS					
	23,000	V_{50}	24,000	V_{50}	25,000	V_{50}
	Distance in feet					
S. L.	4,350	86	4,544	88	4,696	90
1,000	4,475	86	4,664	88	4,836	90
2,000	4,588	86	4,792	88	4,964	90
3,000	4,709	86	4,913	88	5,104	90
4,000	4,824	86	5,034	88	5,231	90
5,000	4,944	86	5,161	88	5,364	90
6,000	5,059	86	5,282	88	5,498	90
7,000	5,180	86	5,403	88	5,632	90
8,000	5,294	86	5,524	88	5,759	90

[1] Steady approach speed through 50 feet height in m. p. h. TIAS denoted by symbol V_{50}.


CONVAIR MODEL 28-5ACF AND PBY-5A LANDPLANE
TAKE-OFF AND LANDING LIMITATIONS
ZERO WIND AND ZERO GRADIENT
CAR 42.81
28-5ACF &
PBY-5A
28-5ACF
BASED ON EFFECTIVE
TAKE-OFF LENGTH
28-5ACF LOS V_{MC} = 95 MPH (TIAS)
PBY-5A LOS V_{MC} = 91 MPH (TIAS)
TAKE-OFF FIELD LENGTH-FT X 100
CAR 42.83
28-5ACF &
PBY-5A
28-5ACF
SEE TABLE 3 FOR
STEADY APPROACH SPEEDS
BASED ON EFFECTIVE
LANDING LENGTH
LANDING FIELD LENGTH-FT X 100
FIG. 1

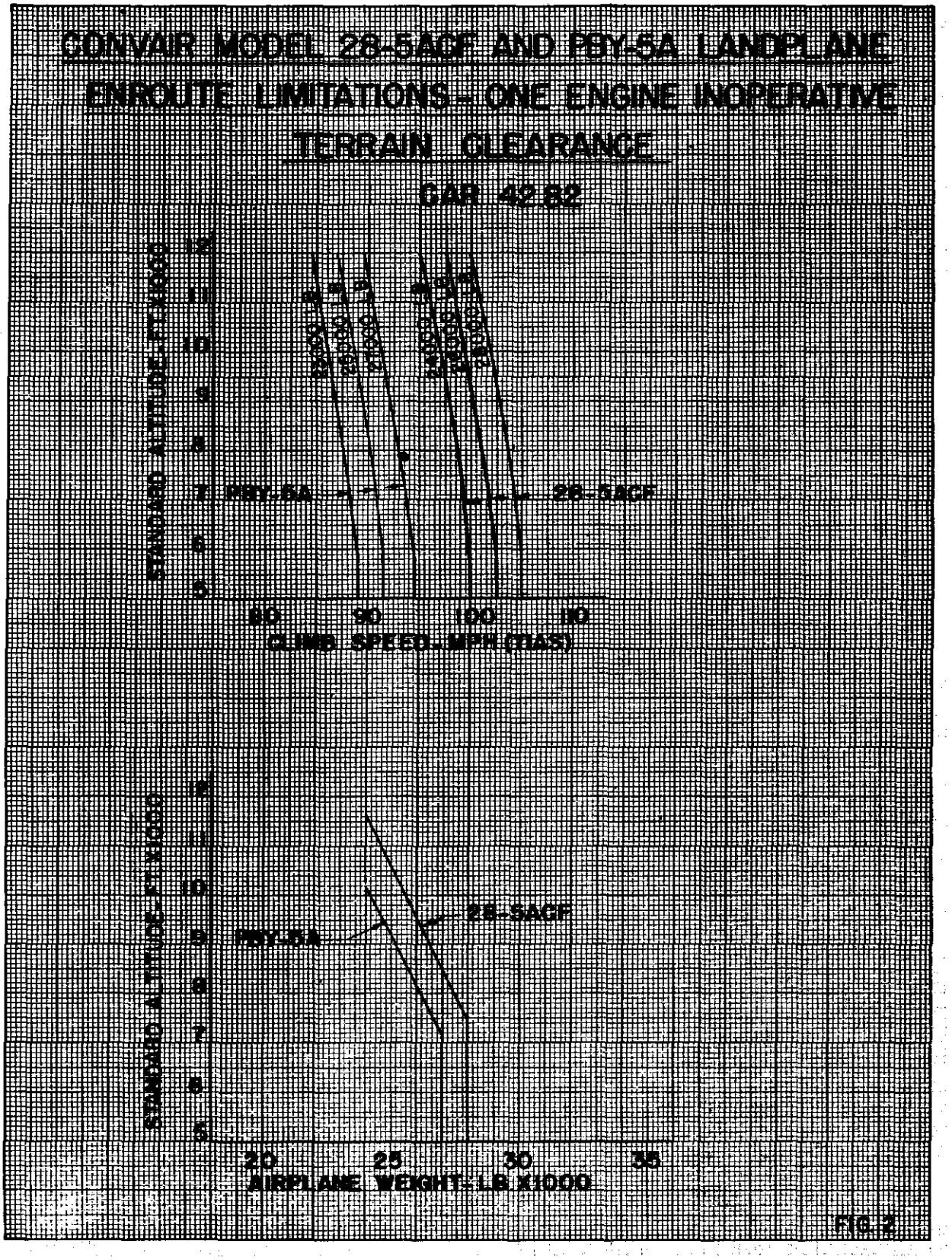

CONVAIR MODEL 28-5ACF AND PBY-5A LANDPLANE
ENROUTE LIMITATIONS – ONE ENGINE INOPERATIVE
TERRAIN CLEARANCE
CAR 42.82
STANDARD ATMOSPHERE PRESSURE ALTITUDE – 1000 FT
PBY-5A
28-5ACF
80
90
100
110
CLIMB SPEED – MPH (CIAS)
STANDARD ATMOSPHERE PRESSURE ALTITUDE – 1000 FT
PBY-5A
28-5ACF
20
25
30
35
AIRPLANE WEIGHT – LB X1000

FIG. 2

TABLE 4—LANDING LIMITATIONS

(a) "Effective length" of runway required when effective length is determined in accordance with CAR 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h. TIAS					
	26,000	V_{50}	27,000 [2]	V_{50}	28,000 [3]	V_{50}
	Distance in feet					
S. L.	3,830	92	3,965	93	4,100	95
1,000	3,940	92	4,080	93	4,220	95
2,000	4,050	92	4,200	93	4,345	95
3,000	4,160	92	4,315	93	4,470	95
4,000	4,275	92	4,430	93	4,595	95
5,000	4,385	92	4,550	93	4,720	95
6,000	4,495	92	4,665	93	4,840	95
7,000	4,610	92	4,785	93	4,970	95
8,000	4,720	92	4,900	93	5,090	95

[1] Steady approach speed through 50 feet height in m. p. h. TIAS denoted by symbol V_{50}.
[2] Maximum weight for PBY–5A landplane.
[3] Maximum weight for 28–5ACF.

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with CAR 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h. TIAS					
	26,000	V_{50}	27,000 [2]	V_{50}	28,000 [3]	V_{50}
	Distance in feet					
S. L.	4,874	92	5,046	93	5,218	95
1,000	5,014	92	5,193	93	5,371	95
2,000	5,154	92	5,345	93	5,530	95
3,000	5,294	92	5,492	93	5,689	95
4,000	5,441	92	5,638	93	5,848	95
5,000	5,581	92	5,791	93	6,007	95
6,000	5,721	92	5,937	93	6,160	95
7,000	5,867	92	6,090	93	6,325	95
8,000	6,007	92	6,236	93	6,478	95

[1] Steady approach speed through 50 feet height in m. p. h. TIAS denoted by symbol V_{50}.
[2] Maximum weight for PBY–5A landplane.
[3] Maximum weight for 28–5ACF.

§ 42.80–5 ***Performance data on Douglas B–18, RB–18A (R1820–53) aircraft (CAA rules which apply to § 42.80).*** The following performance limitations, data, applicable to the Douglas B–18, RB–18A aircraft shall be used in determining compliance with CAR 42.80. These data are presented in tables 1 through 3 and figures 1 and 2. As indicated by the en route limitation data for the Douglas Model B–18 (table 2), operation is restricted to impractical operating weights. Therefore take-off and landing limitations are not presented for this model.

TABLE 1—TAKE-OFF LIMITATIONS

MODEL RB–18A

(a) "Effective length" of runway required when effective length is determined in accordance with 42.1 (a) (12). (Distance to accelerate to 94 m. p. h., TIAS, and stop, with zero wind and zero gradient.)

Standard altitude in feet	Airplane weight in pounds			
	19,000	20,000	21,000	21,300
	Distance in feet			
S. L.	3,685	3,695	3,790	3,820
1,000	3,710	3,815	3,920	3,950
2,000	3,835	3,945	4,045	4,085
2,500	3,890	4,000	4,110	4,150
3,000	4,015	4,130	4,230	4,275
4,000	4,240	4,355	4,475	4,525
5,000	4,475	4,595	4,720	------
6,000	4,710	4,835	------	------
7,000	4,935	5,065	(1)	(1)
8,000	5,170	5,300	------	------

(b) Actual length of runway required when "effective length", considering obstacles, is not determined. (Distance to accelerate to 94 m. p. h., TIAS, and stop, divided by the factor 0.85.)

Standard altitude in feet	Airplane weight in pounds			
	19,000	20,000	21,000	21,300
	Distance in feet			
S. L.	4,250	4,350	4,460	4,495
1,000	4,360	4,490	4,610	4,650
2,000	4,510	4,645	4,755	4,800
2,500	4,575	4,705	4,840	4,880
3,000	4,730	4,855	4,980	5,025
4,000	4,990	5,125	5,260	5,325
5,000	5,260	5,400	5,550	------
6,000	5,550	5,680	------	------
7,000	5,800	5,960	(1)	(1)
8,000	6,080	6,240	------	------

[1] Limited by CAR 42.82.

DOUGLAS B–18, RB18A (R–1820–53)

TABLE 2—EN ROUTE LIMITATIONS

MODEL B–1

Weight in pounds:	*Terrain clearance [1] in feet*
13,500	4,100
13,000	4,600

CAR 42.82 limitation critical for all practical operating weights.

MODEL RB–18A

Weight in pounds	Terrain clearance [1] in feet and climb speed in m. p. h. TIAS			
	Low blower		High blower	
	Feet	Miles per hour	Feet	Miles per hour
21,000	4,270	99.0	------	------
20,600	------	------	4,600	98.0
20,500	------	------	5,900	97.5
20,200	------	------	8,800	96.0
20,000	------	------	8,950	96.0
19,500	------	------	9,400	95.0

[1] Highest altitude of terrain over which airplane may be operated in compliance with CAR 42.82.

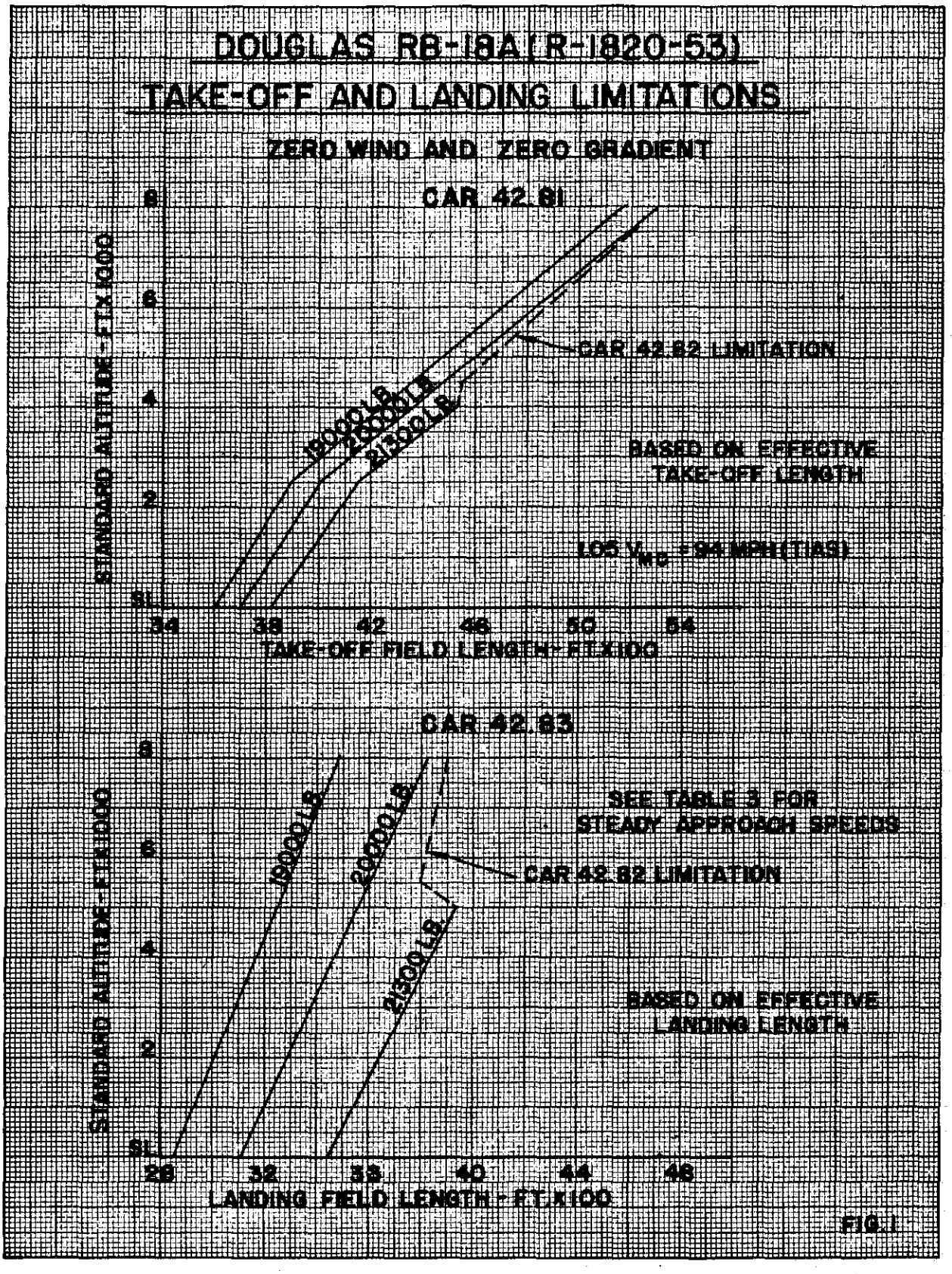

DOUGLAS RB-18A (R-1820-53)
TAKE-OFF AND LANDING LIMITATIONS
ZERO WIND AND ZERO GRADIENT
CAR 42.81
STANDARD ALTITUDE - FT. X 1000
8
6
4
2
SL
CAR 42.82 LIMITATION
BASED ON EFFECTIVE TAKE-OFF LENGTH
105 V_{MC} = 94 MPH (TIAS)
34
38
42
46
50
54
TAKE-OFF FIELD LENGTH - FT. X 100
CAR 42.83
SEE TABLE 3 FOR STEADY APPROACH SPEEDS
CAR 42.82 LIMITATION
BASED ON EFFECTIVE LANDING LENGTH
28
32
36
40
44
48
LANDING FIELD LENGTH - FT. X 100

FIG. 1

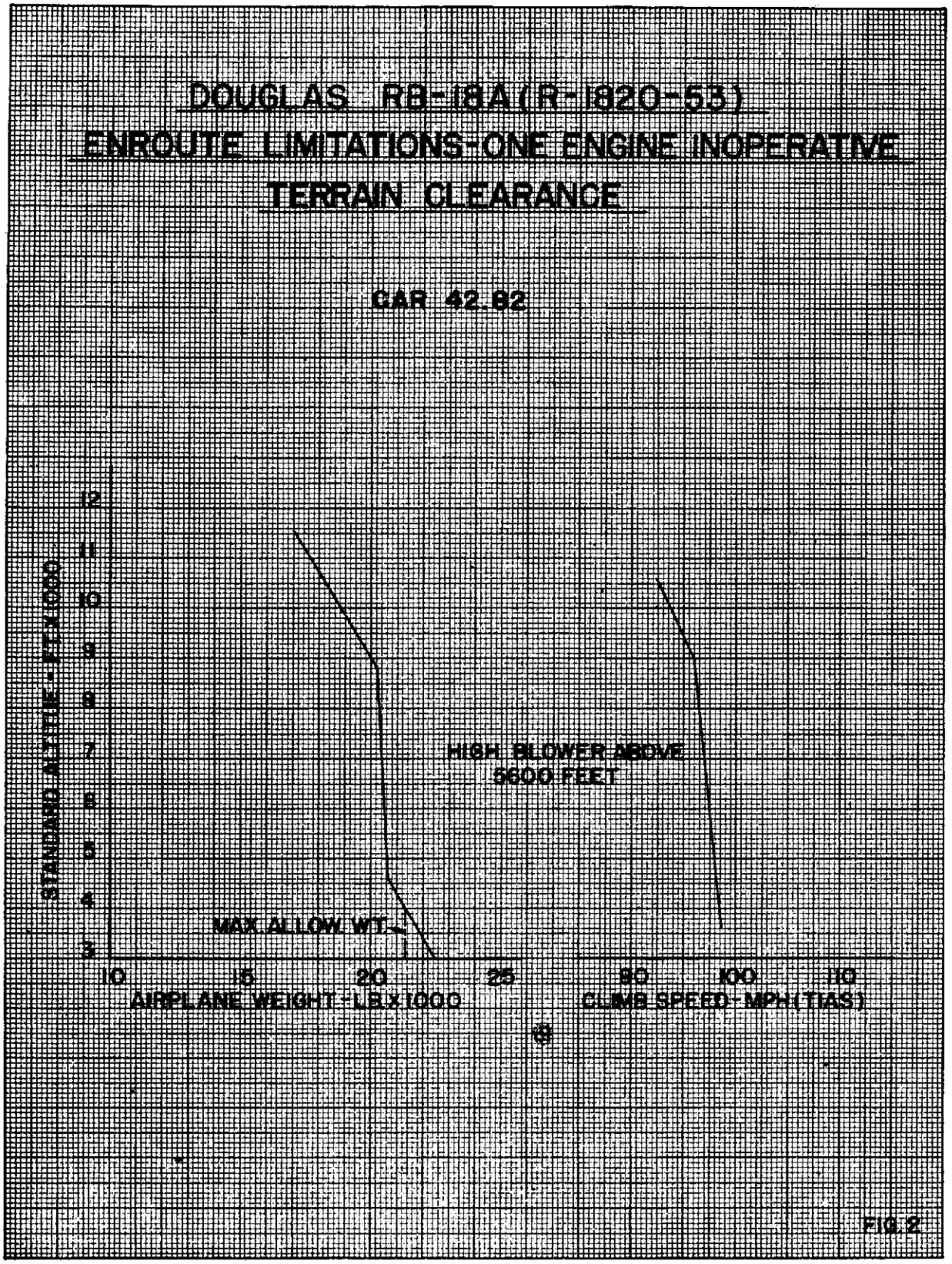

DOUGLAS DB-18A (R-1820-53)
ENROUTE LIMITATIONS-ONE ENGINE INOPERATIVE
TERRAIN CLEARANCE
CAR 42.82
STANDARD ATMOSPHERE-1000 FEET
12
11
10
9
8
7
6
5
4
3
HIGH BLOWER ABOVE 9600 FEET
MAX ALLOW WT.
10
15
20
25
90
100
110
AIRPLANE WEIGHT - LBS X 1000
CLIMB SPEED - MPH (TIAS)
FIG. 2

TABLE 3—LANDING LIMITATIONS

MODEL RB–18A

(a) "Effective length" of runway required when effective length is determined in accordance with CAR 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h.							
	19,000	V_{50}	20,000	V_{50}	21,000	V_{50}	21,300	V_{50}
	Distance in feet							
S. L.	2,850	86.0	3,110	88.5	3,370	90.5	3,445	91.0
1,000	2,930	86.0	3,200	88.5	3,470	90.5	3,545	91.0
2,000	3,010	86.0	3,290	88.5	3,565	90.5	3,640	91.0
3,000	3,085	86.0	3,380	88.5	3,660	90.5	3,740	91.0
4,000	3,165	86.0	3,470	88.5	3,755	90.5	3,835	91.0
5,000	3,245	86.0	3,560	88.5	3,850	90.5	3,935	91.0
6,000	3,325	86.0	3,650	88.5				
7,000	3,405	86.0	3,735	88.5	[2]	[2]	[2]	[2]
8,000	3,485	86.0	3,825	88.5				

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with CAR 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in m. p. h.							
	19,000	V_{50}	20,000	V_{50}	21,000	V_{50}	21,300	V_{50}
	Distance in feet							
S. L.	3,630	86.0	3,960	88.5	4,290	90.5	4,390	91.0
1,000	3,730	86.0	4,070	88.5	4,410	90.5	4,510	91.0
2,000	3,835	86.0	4,190	88.5	4,540	90.5	4,630	91.0
3,000	3,925	86.0	4,300	88.5	4,655	90.5	4,760	91.0
4,000	4,025	86.0	4,415	88.5	4,775	90.5	4,880	91.0
5,000	4,130	86.0	4,535	88.5	4,900	90.5	5,005	91.0
6,000	4,230	86.0	4,645	88.5				
7,000	4,340	86.0	3,750	88.5		[2]	[2]	
8,000	4,440	86.0	3,865	88.5				

[1] Steady approach speed through 50 feet height-m. p. h. TIAS denoted by symbol V_{50}.
[2] Limited by CAR 42.82.

§ 42.80–6 ***En route limitations on multi-engine aircraft with maximum allowable take-off weights below 12,500 pounds*** ***(CAA rules which apply to § 42.80)***. **The following en route limitations data, applicable to Beech D18C, Beech D18S, Lockheed 10E and Lockheed 12A aircraft, shall be used in determining compliance with CAR 42.80. These data are presented in table 1 and figure 1. En route performance data on other aircraft weighing less than 12,500 pounds and operated under CAR 42.16 will be made available by application to the Administrator.**

TABLE 1—EN ROUTE LIMITATIONS

BEECH D18C

Weight in pounds	Terrain clearance [1] in feet and climb speed in m. p. h. TIAS	
	Feet	Miles per hour
9,000	6,200	121.0
8,500	7,300	120.0
8,000	8,450	119.5
7,500	9,600	119.0

[1] Highest altitude of terrain over which airplane may be operated in compliance with CAR 42.82.

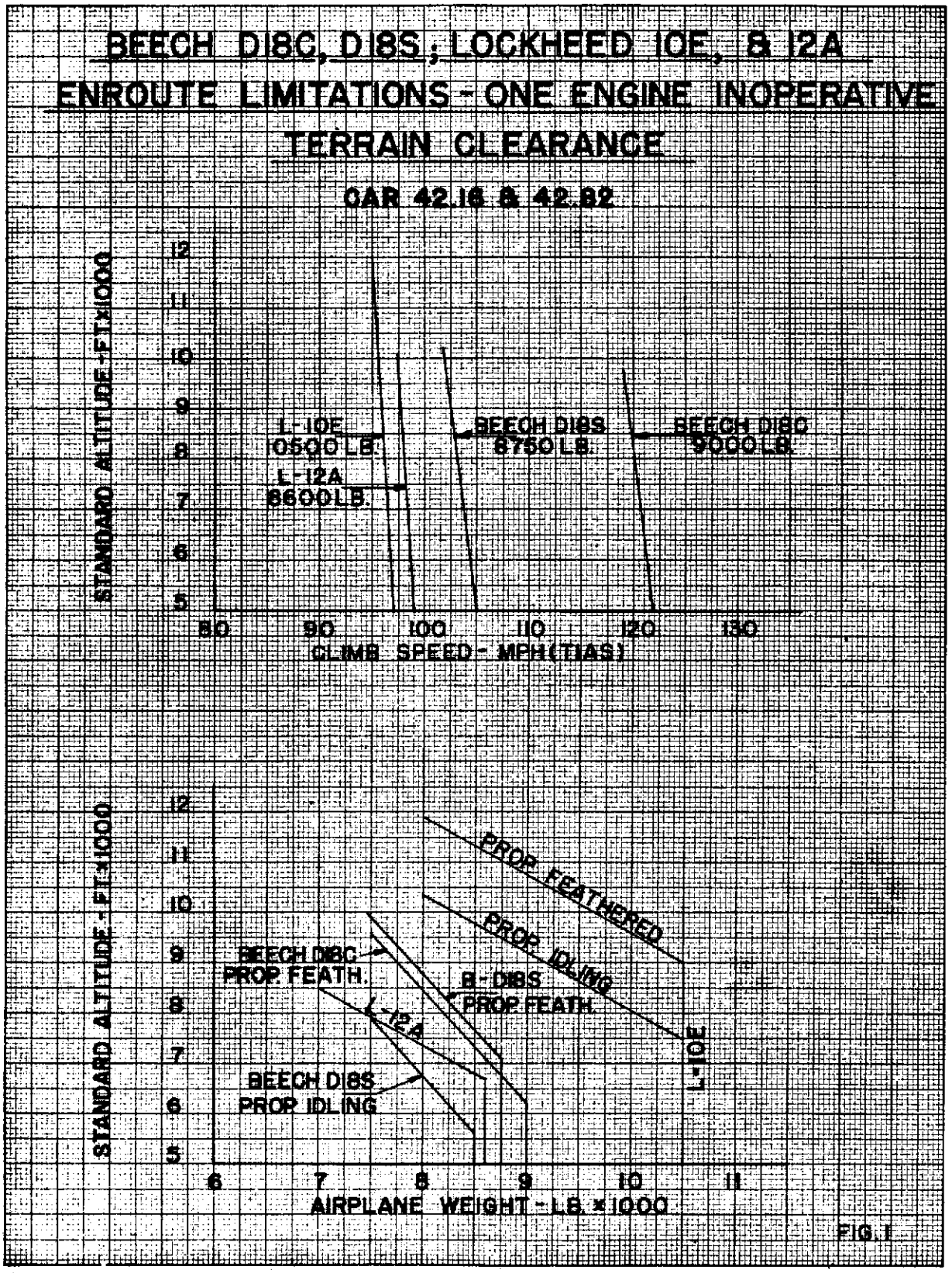

BEECH D18C, D18S; LOCKHEED 10E, & 12A
ENROUTE LIMITATIONS - ONE ENGINE INOPERATIVE
TERRAIN CLEARANCE
CAR 42.16 & 42.82
STANDARD ALTITUDE - FT.×1000
12
11
10
9
8
7
6
5
L-10E 10500 LB.
L-12A 8600 LB.
BEECH D18S 8750 LB.
BEECH D18C 9000 LB.
80
90
100
110
120
130
CLIMB SPEED - MPH (TIAS)
STANDARD ALTITUDE - FT.×1000
PROP. FEATHERED
PROP. IDLING
BEECH D18C PROP. FEATH.
L-12A
B-D18S PROP. FEATH.
L-10E
BEECH D18S PROP IDLING
6
7
8
9
10
11
AIRPLANE WEIGHT - LB. × 1000

FIG. 1

TABLE 1—EN ROUTE LIMITATIONS—Continued

BEECH D18S

Weight in pounds	Terrain clearance [1] in feet and climb speed in m. p. h. TIAS			
	Propeller feathered		Propeller idling	
	Feet	Miles per hour	Feet	Miles per hour
8,750	7,100	103.5		
8,500	7,600	103.5	5,600	104.5
8,000	8,800	102.5	6,700	104.0
7,500	9,900	102.0	7,900	103.0

LOCKHEED 10E

Weight in pounds	Terrain clearance [1] in feet and climb speed in m. p. h. TIAS			
	Propeller feathered		Propeller idling	
	Feet	Miles per hour	Feet	Miles per hour
10,500	9,000	96	7,500	96.5
10,000	9,600	96	8,100	96.5
9,500	10,200	96	8,600	96.5
9,000	10,700	96	9,200	96.5
8,500	11,300	96	9,750	96.5
8,000	11,900	96	10,350	96.5

LOCKHEED 12A

Weight in pounds	Terrain clearance [1] in feet and climb speed m. p. h. TIAS	
	Feet	Miles per hour
8,600	6,700	98.5
8,000	7,400	98.5
7,800	7,950	98.5
7,000	8,500	98.5
6,500	9,000	98.5

[1] Highest altitude of terrain over which airplane may be operated in compliance with CAR 42.82.

"CAR § 42.81 *Take-off limitations.* No take-off shall be made except under conditions which will permit the airplane to be brought to a safe stop within the effective length of the runway from any point on take-off up to the time of attaining, with all engines operating at normal take-off power, 105% of the minimum control speed or 115% of the power-off stall speed in the take-off configuration, whichever is greater, as shown by the accelerate-stop distance data.

"(a) In applying this requirement take-off data shall be based upon still-air conditions, and no correction shall be made for any uphill gradient of 1% or less when such percentage is measured as the difference between elevation at the end points of the runway divided by the total length. For all uphill gradients greater than 1%, the effective take-off length of the runway shall be reduced 20% for each 1% grade."

"CAR § 42.82 *En route limitations; one engine inoperative.* No airplane shall be taken off at a weight in excess of that which, with the critical engine inoperative, would permit a rate of climb of at least 50 feet per minute at an altitude of at least 1,000 feet above the elevation of the highest ground or obstruction within 10 miles of either side of the intended track or at an altitude of 5,000 feet, whichever is higher. For the purpose of this section it shall be assumed that the weight of the airplane as it proceeds along its intended track is progressively reduced by the anticipated consumption of fuel and oil; that the propeller of the inoperative engine is in the minimum drag position; that the wing flaps and landing gear are in the most favorable positions; and that the remaining engine or engines are operating at the maximum continuous power available. The 10-mile lateral distance specified herein may, for a distance of no more than 20 miles, be reduced to 5 miles provided that special air navigational facilities provide a reliable and accurate identification of any high ground or obstruction located outside of such 5-mile lateral distance but within the 10-mile distance."

"CAR § 42.83 *Landing distance limitations; airport of destination.* No airplane shall be taken off at a weight in excess of that which, under the conditions hereinafter stated in paragraphs (a) and (b) of this section, would permit the airplane to be brought to rest at the field of intended destination within 70% of the effective length of the runway from a point 50 feet directly above the intersection of the obstruction

clearance line and the runway. For the purpose of this section it shall be assumed that the take-off weight of the airplane is reduced by the weight of the fuel and oil expected to be consumed in flight to the field of intended destination.

"(a) It shall be assumed that the aircraft is landed on the most favorable runway and direction without regard to wind.

"(b) It shall be assumed, considering every probable wind velocity and direction, that the aircraft is landed on the most suitable runway, taking due account of the ground handling characteristics of the airplane and allowing for the effect on the landing path and roll of not more than 50% of the favorable wind component.

"(c) If the airport of intended destination will not permit full compliance with paragraph (b) of this section, the aircraft may be taken off if an alternate airport is designated which permits compliance with paragraphs (a) and (b) of this section."

REQUIRED RECORDS AND REPORTS

"CAR § 42.91 *Maintenance records.* Each air carrier shall keep at its principal operations base the following current records with respect to all aircraft, aircraft engines, propellers, and, where practicable, appliances used in air transportation:

"(a) Total time and service,

"(b) Time since last overhaul,

"(c) Time since last inspection, and

"(d) Mechanical failures."

42.91–1 CONTENT OF MAINTENANCE RECORDS. (*CAA policies which apply to section 42.91.*)

The basic requirement of the above records is to provide a means for determining that overhaul, inspection, and check of the various units or components is performed within the prescribed time limitations. In the case of appliances, any method which will accomplish this result, other than keeping of individual time records on the units themselves, will be satisfactory.

42.91–2 PRINCIPAL MAINTENANCE BASE. (*CAA policies which apply to section 42.91.*)

When the principal maintenance base is at a location other than the principal operations base, the term "Principal Operations Base," when applied to maintenance matters, shall be considered to mean the principal maintenance base. Copies of the necessary records shall also be maintained at the principal operations base if it is in a region other than the one in which the principal maintenance base is located.

42.91–3 RETENTION OF RECORDS. (*CAA policies which apply to section 42.91.*)

The records required by this section shall be preserved and retained by the air carrier for a period of 2 years. For additional requirements pertaining to preservation of records, see Part 249 of the Economic Regulations of the Civil Aeronautics Board.

"CAR § 42.92 *Airman records.* An air carrier shall maintain at its principal operations base current records of every airman utilized as a member of a flight crew. These records shall contain such information concerning the qualifications of each airman as is necessary to show compliance with the appropriate requirements prescribed by the Civil Air Regulations. No air carrier shall utilize any airman as a flight crew member unless records are maintained for such airman as required herein."

42.92–1 CONTENT OF AIRMAN RECORDS. (*CAA policies which apply to section 42.92.*)

(a) GENERAL. The following pertinent information is considered the minimum necessary in the airman records required by this section:

(1) Name (in full);

(2) Current duties and date of assignment (pilot, engineer, navigator, etc.);

(3) Airman certificates (type, number, and ratings);

(4) Date, result, and class of last physical examination;

(5) Date and result of last 6-month instrument competency flight check for each pilot in command;

(6) Record of each pilot's flight time including trip time, instrument, night flight time,

and flight time in the make and model of aircraft on which he is currently qualified;

(7) Records of company training for all crewmen, including actual flight, synthetic flight, and maintenance of proficiency training;

(8) Any check pilot authorization.

42.92-2 AVAILABILITY OF RECORDS. (*CAA policies which apply to section 42.92.*)

The above information shall be made available at any time for inspection by an authorized representative of the Administrator or Board.

42.92-3 RETENTION OF RECORDS. (*CAA policies which apply to section 42.92.*)

The disposition of any flight crew member released from the employ of the air carrier, or who becomes physically or professionally disqualified must be so indicated in these records and such records shall be retained by the company for at least 1 year. For additional requirements pertaining to preservation of records see Part 249 of the Economic Regulations of the Civil Aeronautics Board.

"CAR § 42.93 *Emergency flight reports.* In the case of emergencies necessitating the transportation of persons or medical supplies for the protection of life or property, the rules contained herein regarding type of aircraft, equipment, and weather minimums to be observed will not be applicable: *Provided,* That within 48 hours after any such flight returns to its base the air carrier shall file a report with the Administrator setting forth the conditions under which the flight was made, the necessity therefor, and giving the names and addresses of the crew and passengers."

42.93-1 SUBMISSION OF EMERGENCY FLIGHT REPORTS. (*CAA policies which apply to section 42.93.*)

The report referred to in this section shall be submitted in duplicate to the local Aviation Safety Agent, and a copy shall be retained by the air carrier for at least 1 year.

"CAR § 42.94 *Pilot's emergency deviation report.* Where pursuant to authority granted in § 42.51 (d) a pilot has deviated from established methods or requirements, he shall, within 7 days after completion of the trip, file with the Administrator a report thereof giving a brief statement concerning the circumstances of the emergency and the nature of the deviation."

42.94-1 SUBMISSION OF PILOT'S EMERGENCY DEVIATION REPORT. (*CAA policies which apply to section 42.94.*)

The report referred to in this section shall be submitted in duplicate to the local Aviation Safety Agent, and a copy shall be retained by the air carrier for at least 1 year.

"CAR § 42.95 *Flight manifest record.* A signed copy and any revision of the flight manifest required by § 42.62 shall be retained in the personal possession of the pilot for the duration of the flight, and a duplicate copy thereof shall be retained by the air carrier at its principal operations base for at least one year after completion of the flight."

"CAR § 42.96 *Reporting of malfunctioning and defects.* An air carrier shall report in a manner prescribed by the Administrator all malfunctioning and defects occurring during operation or discovered during inspection which cause or may be reasonably expected by the air carrier to cause an unsafe condition in any aircraft, engine propeller, or appliance. The corrective action taken by the air carrier to prevent recurrence of the malfunctioning or defect shall be indicated."

42.96-1 MECHANICAL HAZARD AND DIFFICULTY REPORTS. (*CAA rules which apply to section 42.96.*)

(a) GENERAL. The following reporting procedure will apply to all certificated irregular air carriers which operate large aircraft and eliminates the necessity for submission of Form ACA-1226 by these operators.

(b) DAILY MECHANICAL REPORTS.

(1) SUBMISSION OF REPORTS. Whenever a failure, malfunction, or other defect[6] is detected in flight or on the ground in an aircraft or aircraft component, which may reasonably be expected by the air carrier to cause a serious hazard in the operation of any

[6] Failures, malfunctions, or other defects not covered by CAR Part 62, which are to be reported under these rules, comprise generally the following basic items: Fire hazards, structural hazards, serious system or component malfunctions or failures, unsafe procedures or conditions, and defects in design or quality of parts and materials found installed on aircraft or intended for such installation.

aircraft, notice thereof is to be transmitted to the nearest CAA Aviation Safety District or Regional Office in the area in which the aircraft is being operated.

(2) TIMES OF SUBMISSION. Such daily reports should be submitted only where mechanical hazards have been detected; should be submitted within the 24-hour period from midnight to midnight of the day of occurrence; and should be transmitted to the nearest Aviation Safety Office before noon of the following working day when possible, except that reports for Fridays, Saturdays, and Sundays should be submitted not later than noon of the following Monday. When it is impossible to furnish the report before noon due to scheduling, it should be reported as early as possible, but in no case later than 24 hours after the period for which the report is submitted. It is not necessary that the operator's personnel personally appear at the CAA office since such reports may be transmitted by telephone, wire, or other rapid means of communication.

(3) METHOD OF TRANSMISSION. Such reports may be transmitted in a manner or on a form convenient to the air carrier's system of communications and procedures.

(i) SUGGESTED FORM FOR TRANSMISSION. Whenever practicable, the following guide for each aircraft type should be used by the air carrier in submission of the daily reports:

(*a*) Type, CAA identification number of aircraft, air carrier, and date;

(*b*) Emergency procedure effected (unscheduled landing, dumping fuel, etc.);

(*c*) Nature of condition (fire, structural failure, etc.);

(*d*) Identification of part and system involved, including the model designation of the major component (e. g., P & W R-2800-34);

(*e*) Apparent cause of trouble (wear, cracks, design, personnel error, etc.);

(*f*) Disposition (repaired, replaced, aircraft grounded, etc.);

(*g*) Brief narrative summary to supply any other pertinent data required for more complete identification, determination of seriousness, corrective action, etc.

(4) SUPPLEMENTARY INFORMATION. The daily reports should not be withheld pending presentation of all specific details pertaining to such items of information. As soon as the additional information is obtained, it is to be submitted in an expedited supplement to the original report, making reference to the date and place of submission of the first report.

(c) MONTHLY REPORT OF CHRONIC MECHANICAL DIFFICULTIES. As soon as practicable after the end of each calendar month, each certificated irregular air carrier operating large aircraft shall submit three copies of a report covering the mechanical difficulties experienced during the preceding month which they consider chronic or otherwise particularly significant from a safety standpoint. The report is to fully identify all components (manufacturer, model, type, etc.) and contain sufficient information so as to enable a determination of the trend of failures and defects and to provide information on which to base corrective action. The detailed information from which such reports are prepared shall be kept current and available for examination at the air carrier's main headquarters by any authorized representative of the Administrator or Board.

The reports shall be submitted to the office of the assigned Aviation Safety Agent—Aircraft Maintenance for review, appropriate investigation, and forwarding to the Washington office of the Air Carrier Maintenance Branch.

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